THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The much-talked-of purchases of Bessemer iron by the United States Steel Corporation have been concluded this week. The total taken is between 100,000 and 110,000 tons for delivery in the third quarter and the price is $18.50 at Valley furnace, with the exception of a 5,000-ton lot for June delivery, which was at $19 at furnace, and a round lot taken by a Cleveland furnace at $18, Cleveland. Corporation officials announce that further iron will be taken for third quarter delivery at $18.50 in the Valley, but the amount of additional tonnage required is not stated. Other steel companies have also been in the market and have made purchases, some of these preceding and others following the steel corporation deals. One transaction this week is reported at $19.35 at Valley furnace, four months deliveries, beginning with June. This heavy buying, together with the fact that the corporation's requirements for the third quarter are larger than was expected, considering the additions to its blast furnace capacity this year, has given a better tone to the market. The known requirements of steel works in the next four months put a very different aspect upon the industry from that indicated in recent pessimistic statements from uninformed quarters. An important factor is the absence of any labor trouble in the iron trade itself. The tin plate wage schedule has been settled with more promptness than in years, and the iron and sheet scales are expected to be arranged by the end of this week. It is significant that with the large demands of steel works upon the pig iron industry, there is still a very firm market for steel and no signs that domestic billets and sheet bars are to be any more plentiful in the third quarter than in recent weeks. No new contracts for steel are reported, and German works offer no better deliveries. Negotiations are under way based on $28 to $28.50 for German basic Bessemer, delivery in the latter part of the third quarter, but transactions are not reported. Apart from the large buying in Bessemer, the pig iron market has continued inactive. The steel corporation is not in need of further basic iron for the third quarter, but outside steel interests will make additional purchases of basic and Bessemer iron. The situation in foundry iron has not changed, but a meeting of the Southern association furnaces will be held in the coming week at which a new price is expected to be named on which business is likely to be done freely for the second half of the year. The steel corporation has just paid for Bessemer iron $2 a ton above the $16.50 basis on which it made its last contract, that for 200,000 tons in April, 1902. In that same month Southern iron was selling at $14 and $15 for No. 2 foundry, Birmingham, while large producers were nominally quoting $12 but selling no iron. While steel-making pig and foundry pig are governed by different conditions, the transactions in Bessemer the past week will have their influence upon the Southern association price, which may be fixed below the recent quotations of independent furnaces, to start with, the theory of producers being that any appearance of a buying movement would give a firmer market. Consumption of foundry iron is undeniably heavy; and in many cases new purchases call for quick delivery. An important element, difficult to measure, is the curtailment of consumption by labor troubles. These are acute in spots, but not of a character likely to involve long contests. But the labor increments have accumulated steadily and their effect must be felt soon in curtailed consumption, for new work will not be undertaken at top notch prices. The pressure for lower prices on finished material has been strong from the consumers of bar iron, with the outcome yet uncertain, though a weaker condition has been created in the Central West by the developments in the East. Lower scrap also facilitates the concessions that are made by smaller interests. The consumption of structural material is very heavy, and the interruption of work at various points is not felt to the extent that might be expected. The American Bridge Co. reports some large contracts closed the past week. Tin plate mills are sold for most of August and the leading producer is now ready to take September business. Rail specifications are heavy and a mill that went from rails to sheet bars resumes on rails May 31. Considerable rail business has been refused recently because deliveries could not be made. Reports of postponements by railroads on existing contracts are contradicted.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, May 27.

(Special Telegram.)

A round block of Bessemer iron is reported today to have sold at $19.35 at Valley furnace, deliveries running over four months, commencing with June. Steel interests outside the steel corporation were the purchasers.

The purchases of Bessemer iron by the steel corporation for third quarter appear to be between 100,000 and 110,000 tons. Of this association furnaces furnish 43,000 tons, W. P. Snyder 35,000 tons, and other furnaces about 25,000 tons.

Eastern mills are generally quoting 1.70c, Lebanon, on bar iron; Pittsburg delivery is somewhat higher.

The United States Steel Corporation has just made the pig iron purchase which has been under negotiation for some time. The purchase might have been made earlier, had not some time been consumed in adjusting matters on the old 200,000-ton contract at $16.50, Valley, deliveries on which got very much behind, so that a large tonnage is yet undelivered, although the original contract was for shipment October to March. The corporation pig iron committee decided recently to go back to the original method of buying iron, from quarter to quarter. This rule was observed until the spring of last year, when it became evident that a forward purchase would be very advantageous, as the market was just ready for a large advance, and the $16.50 purchase was therefore made early in April—200,000 tons for October to March shipment. Until now the corporation has not bought any large block or iron, although occasional small purchases were made.

The deal as concluded this week was for 5,000 tons of June-July iron at $19, Valley furnace, and between 85,000 and 88,000 tons for third quarter at $18.50, Valley furnace. The whole inquiry was laid before the Bessemer Furnace Association, but having a considerable tonnage yet to deliver on the old contract, and having a number of sales to outside interests also to take care of in the third quarter, the association could agree to furnish only between 43,000 and 45,000 tons of the iron required, for the third quarter. The remainder of the third quarter iron, and the 5,000 tons of early iron, are to come from furnace interests represented by W. P. Snyder & Co. It is stated that further purchases will be made by the corporation on the basis of $18.50, Valley furnace.

Under the contracts just placed, with a purchase made a few weeks ago, the steel corporation has about 110,000 tons of steel-making pig coming to it in the third quarter, plus quite a large tonnage due on the old contract,

which indicates a larger demand on the part of corporation steel works than formerly, notwithstanding the fact that it now has four new furnaces in operation. It is evident that all the steel works are to be run to their utmost capacity for some time on orders already booked.

The important interests in the trade regard the present outlook as entirely satisfactory and look for excellent business all through this year. Their position is in striking contrast with the feeling of pessimism which pervades Wall Street. It is usually assumed that the recent declines in the steel stocks has been due to the various bearish reports which have been in circulation regarding the position of the steel trade. This is not correct. Watching carefully the inception and spread of these reports it can be seen that they have not been the precursors of the drops, and have scarcely even been contemporaneous with them. The attacks have first been made on the market, and during the progress of them the bearish reports have been started, merely to aid the manipulations, the state of the market facilitating the spread of reports which would otherwise be lost at the start.

Conditions within the trade are reassuring. Consumption of finished steel products is up to the capacity of finishing mills, and there is no prospect of any labor trouble in the iron and steel trade proper. The tin plate scale has been signed and the iron and sheet scales are likely to be by the end of next week. Crude steel, while in limited demand, is very firm and the available supply extremely small and held at the fictitiously high level which has prevailed for about two years.

The leading tin plate interest, which had for some months been filled to August 1, beyond which date it would not take business, now finds that it will take nearly all of August to complete business already taken, while on the signing of the wage scale it has opened its books for September shipment. It is stated positively that no change in prices of tin plates, either coke or charcoal, will be made, but there is a report that terne plates will be reduced five cents a box. Nothing but a prolonged drought in important canning districts would have prevented a very uncomfortable shortage in tin plate, and as it is, the premiums of 20 to 25 cents a box on early delivery are expected to rule through the summer months.

A decided weakness has developed in iron bars. With the disruption of the Eastern Bar Iron Association the practice has been resumed of quoting f. o. b. Eastern mill, Western mills also being lower in quotations, and within the past few days it is understood the leading interests have been meeting delivered prices of such competition.

Pig Iron.—As noted, the steel corporation has just this week closed with the associated and other furnaces for 85,000 to 88,000 tons of third quarter Bessemer and 10,000 tons of June-July iron, the former at $18.50, Valley, and the latter at $19, Valley furnace. In regard to the price on third quarter iron it must be noted that the corporation recently agreed to take care of the furnaces on all coke needed for any iron it received, at the official price. The furnaces will not necessarily get their coke from the corporation, but can call for it should any such stringency occur as in the past winter, when spot coke reached very high prices. Furnaces do not propose to sell any iron to other consumers, where no coke is involved, at less than $19, and may ask a higher figure for third quarter. A number of sales of Bessemer and basic iron have been made to outside steel interests in the past fortnight, the total aggregating a very comfortable tonnage, for early and third quarter delivery, at from $19.25 up to $19.45, Valley, and possibly higher. Altogether, the steel making pig market has become very strong, with the ten associated Valley furnaces entirely sold up, and independent interests also well booked. Two new furnaces, which were expected to cause some disturbance, are understood to be now well filled, and to be no longer even a possible disturbing factor.

In foundry iron the market is still waiting. Foundries have plenty of prompt iron, and are also largely covered on third quarter, so that any early buying is not likely, despite the strong impetus the corporation purchase will naturally give the market. Northern No. 2 is quoted by furnaces all the way from $20.50 to $21, Pittsburg, for extended delivery, and prompt iron would not bring any higher figure, as there is more than enough reselling to keep prompt prices down. As the furnaces have a large tonnage on books for third quarter, there is no disposition to invite purchases by making low quotations, while it is recognized that if conditions warrant any further decline in foundry grades, to put them on the now well established level for Bessemer, they will be forthcoming at the proper time. In forge iron furnaces quote $19.75 to $20, Pittsburg, with practically no buying so far, but there are signs of some buying shortly by the iron mills. Southern iron is practically a dead letter in this market. Those of the furnaces in the association are claimed to be adhering strictly to the "official" prices, which are $19.85 for forge and $21.35 for No. 2 foundry, delivered Pittsburg, but are of course selling no iron. Outside furnaces quote nominally about 50 cents below these figures, but do not seem to be doing any business locally. We quote prices for nearby and third quarter as follows:

Bessemer, Valley	$19 00 to 19 50
Bessemer, Pittsburg	19 85 to 20 35
No. 1 Foundry	21 25 to 22 00
No. 2 Foundry	20 50 to 21 00
Gray Forge, Pittsburg	19 75 to 20 25
Chilled Basic, Valley	19 15 to 19 50
Chilled Basic, Pittsburg	20 00 to 20 35

Steel.—The market is more quiet than it was, the demand for prompt steel having been pretty well settled. The market has shown no particular signs of weakness, however, and Bessemer billets for early shipment are quoted $30 at mill or $31 Pittsburg. Such prices are of course entirely out of harmony with either pig iron or finished products. Some little inquiry is developing for extended delivery, but the inquirers appear to be merely desirous of information. No opinion is available as to the basis on which any large business which may later come into the market will be done. Sheet bars do not seem to be obtainable, although there are several prospective sources of supply. Wire rods are $36 to $37.

Ferro-Manganese.—There is nothing new in this line and we continue to quote English 80 percent ferro at $50 in large lots and $52.50 in small lots, delivered.

Muck Bar.—The market is quiet, with mills quoting $35 to $35.50 for best local grades, delivered Pittsburg. We hear a rumor of 300 tons sold at $34.50, but cannot confirm this, and it may have been Eastern stock.

Skelp.—The market is quiet, mills being well sold up for the present and little inquiry for later delivery. Steel skelp for early shipment is quite scarce. We quote steel at 2c for grooved and 2.10c for sheared, with iron possibly a dollar a ton lower.

Rails and Track Material.—The rail market is uneventful, with mills sold up clear through the year on standard steam sections, and being decidedly behind on deliveries, with the prospects of carrying a large tonnage over to next year. A couple of orders, aggregating over a hundred thousand tons, were lately offered to the rail mills and refused, the buyers desiring most of the tonnage to be shipped this year. We quote: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds in carload lots, $39; less than carload lots, $40; 12 pounds, $38; 16 and 20 pounds, $36; 25 to 40 pounds, $36. Track materials: Spikes, 2.15c to 2.20c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rails contracts, otherwise 2c to 2.10c is asked.

Plates.—Specifications continue good on plates, with a little new business, and mills are well taken care of. Premiums are secured only on small lots for quick shipment, ordinary lots being available at pool prices and for reasonably prompt delivery. Official prices are strictly maintained on all large business, and prices remain: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c,

and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16 inches in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Pipes and Tubes.—Mills are very busy, having all the orders they can possibly take care of, booking being particularly heavy since the first of the month. We quote official prices as follows, in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	62	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
¼ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

Bars.—There has been no large business done in iron bars, and reports of shading by various independent interests continue. It looks as if the iron bar market would work around to the proper parity with relation to steel bars. While official prices of the leading interests are unchanged for local delivery, it is reported that the leading interests have met lower prices in other districts. However, the volume of business has been small and there will be no heavy contracting until the market settles. The usual outside quotation is 1.70c, f. o. b. mill, but local mills are not sellers at this time. In steel bars business is good and specifications and contracts keep mills filled with all the business they have the steel for. We quote: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Youngstown, or 1.84¼c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Structural Material.—The only matter which interests the trade is the possible bad effect of labor troubles in various building trades, which are not over yet, and which are retarding what would otherwise be a season of unprecedentedly heavy consumption. The effect of labor unrest is felt not merely in delay to work already contracted and started, but has extended to an important degree to projects which are still in the formative stage. However, mills are working up to their capacity for the time being, and prices are of course strictly maintained. We quote as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—There is more complaint than a week ago regarding deliveries, the fact that mills are oversold or unable to get sufficient steel being accentuated by increased difficulty in moving freight. Still, a discordant element has appeared in lower quotations by an independent interest which has come to be regarded generally through the trade as a disturbing factor whenever it does business. Quotations generally are unchanged, the official figures being quoted on large lots, and advances for small lots. The annual easing up is due in the fall. Stocks in jobbers' hands are very small and there is some difficulty in filling orders from store. There is no danger from an overstock, the experience of last year being too fresh in the minds of the trade, and the whole market is on a conservative basis. On contracts for 500-bundle lots and over we quote regular prices as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

Wire and Nails.—There is no shading in any line, and mills are filling contracts already taken, being in receipt of a fair amount of new business, consistent with the season. We quote: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—The merchant steel trade is in satisfactory shape, prices being firm all along the line. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

Spelter.—The market has been quiet, with no change in prices since last week. Spot spelter continues very scarce. We quote the market at 5.63½c, Pittsburg, for spot and 5.53½c for forward delivery.

Old Material.—The market continues in a state of transition, and has not adjusted itself enough to the new conditions in the pig iron market, which are themselves not entirely fixed, to warrant any extensive commitments on the part of consumers. There is some demand for heavy melting stock, and it is reported that a bid of $21.25, delivered Pittsburg, on new stock has been turned down, holders demanding a slightly higher price. We quote ordinary melting stock nominal at $20 to $21 and No. 1 cast scrap nominal at around $19.

Coke.—There are signs of trouble in the freight movement, but so far nothing serious has resulted. The odd lots of prompt coke held in various hands are disappearing and the market is getting settled. There is little disposition to contract for second half as yet, and there is hardly any market on contract. Spot furnace coke is quoted about $3.50, but a number of sales have been put through at lower figures. Foundry coke is about a dollar higher. For the week ended Saturday, May 16, production in both the Connellsville regions showed an increase, close to the records, the upper Connellsville making 251,000 tons, against 250,000 tons the previous week, and the lower Connellsville region 53,520 tons, against 53,100 tons, a total of 304,100 tons, against 303,100 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, May 26.

Confidence in this market is being restored. There is yet no snap to buying, but a firmer tone is prevalent in some quarters. Two independent Southern furnaces that

have been offering iron in this market on the basis of $15.50 and $16 at furnace have notified their agents not to quote lower than $17.50 on all future inquiries, while another furnace in the South, which has been selling below official prices, has withdrawn from the market entirely for the time being. A considerable portion of the iron that has been offered in this city at the low prices has been on resales, and it is stated that this is now practically worked off. Bar iron manufacturers have taken new hope from the fact that there is less competition for the business being offered. Consumers who in the past few weeks have had mills and furnaces begging for orders and specifications, now find a changed attitude. There is no great amount of business being placed, nor have prices on either pig iron or bars advanced, but the stronger tone of the market prompts the expression of optimistic opinions by manufacturers of these products. Pig iron can still be bought at $15.50 Birmingham for No. 2 foundry, and bar iron at 1.75c Chicago, but these prices apply only on orders for quick delivery and are subject to immediate acceptance. They would not be made on contracts for future shipments.

The reason for this change of feeling is due largely to the purchases of the United States Steel Corporation of Bessemer and forge iron for delivery in the third quarter. The changed attitude of public opinion towards the labor leaders in this city who are becoming alarmed at the ruin to business they are creating by their arbitrary methods is also responsible for a better market sentiment while the facts that stocks of all metal products throughout the country are low and that crop prospects are excellent, have aided in bringing about a firmer market. It is not doubted that within a few weeks if not sooner the local strike situation will have cleared itself, and the market will then resume its normal condition.

There has been a good demand during the week for plates, merchant pipe, light and heavy rails, structural steel and other heavy products. Comparatively good buying has also been done in iron and steel bars, but consumers are still disposed to contract only for their immediate requrements. Both mills and consumers are taking advantage of the present lull to clean up their stocks, and the latter are filling up their requirements with orders for odds and ends on jobbers. Every indication points to an early buying movement.

Pig Iron.—The market during the week past has been quiet, with fewer offerings of iron at less than association prices. Neither buyers nor sellers seem disposed to do much trading, both sides believing that the market will shortly emerge from the uncertainty that has surrounded it for the past two months. There is less disposition on the part of independent furnaces to offer iron at the prices that have been current, and while $15.50 Birmingham for No. 2 foundry can still be done, it applies only on orders for immediate shipment. For extended deliveries higher prices are asked. Our quotations are without change, and are as follows:

Lake Superior charcoal	$24 00 to 25 00
Local Coke Foundry No. 1	21 50 to 22 00
Local Coke Foundry No. 2	21 00 to 21 50
Local Coke Foundry No. 3	20 50 to 21 00
Local Scotch Foundry No. 1	21 50 to 22 00
Southern Coke No. 1	20 35 to 22 35
Southern Coke No. 2	19 85 to 21 85
Southern Coke No. 3	19 35 to 21 35
Southern Coke No. 4	18 85 to 20 85
Southern No. 1 soft	20 35 to 22 35
Southern No. 2 soft	19 85 to 21 85
Southern Gray Forge	19 85 to 20 35
Southern Silveries (4% to 5% silicon)	22 85 to 23 85
Southern Silveries (5% to 6% silicon)	23 35 to 24 35
Jackson Co. Silveries (6% to 8% silicon)	29 30 to 30 30
Ohio Strong Softeners	24 00 to 24 50
Alabama and Georgia Car Wheel	28 35 to 29 35
Malleable Bessemer	21 50 to 22 00
Standard Bessemer	21 50 to 22 00
Basic iron	22 35 to 22 85

Bars.—Demand for both iron and steel bars in the week under review has been of fairly good proportions, but it is not yet what it should be. Some consumers of steel have contracted for their requirements up to July 1, 1904, and others to Jan. 1, 1904, but the total tonnage is not large. Two orders for 1,000 tons each have also been placed with bar iron mills, but as these are from consumers whose yearly needs are exceptionally large, they cannot be taken as an evidence of increased confidence in the stability of the market. The general trade is still disposed to buy for only about 75 percent of its requirements, covering needs for a few weeks at a time, and does not feel that the time is ripe for placing large orders. Mill men, however, seem not to be worrying over the situation, as they realize that it is but a matter of a short time before consumers will be forced into the market. Stocks among distributers and others throughout the country are low, and with excellent prospects for good crops, manufacturers see nothing in the outlook to cause alarm. Steel is being held firm at official quotatons, and while iron can be purchased on the basis of 1.75c this price applies only on orders for immediate shipment. For extended deliveries, $1 to $2 per ton more is asked. We quote mill shipments, Chicago delivery, as follows: Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops, in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.75c to 1.80c. Quotations from store are as follows: Steel, 2c to 2.10c; iron, 2.10c to 2.15c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

Sheets.—There has been a slightly better inquiry during the week under review, and the tone of the market is stronger. Our quotations are without change, and for mill shipments, carload lots, Chicago delivery, are as follows: Black sheets, No. 27, 2.86½c; No. 28, 2.96½c. Galvanized 75 and 5 percent. On lots from store, we quote No. 27 Black, 2.95c to 3c; No. 28, 3.05c to 3.10c. Galvanized 75 and 2½ percent to 75 percent.

Structural Steel.—A few small deals that have been pending several weeks have been closed, bringing the tonnage of new business placed with mills last week to about 1,500 tons. Specifications are plentiful, and there is a good demand from store. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Store trade is quoted at 2¼c per pound.

Plates.—Western mills are well sold up and are accepting orders for only such deliveries as they can give. On this basis, contracts have been closed in the past week for about 6,000 tons of material. Several hundred tons have also been placed with Central Western mills, which are in better position to give prompt shipments. We quote mill prices, Chicago delivery, as follows: Tank steel, ¼-inch and heavier, 1.75c; flange steel, 1.85c. Prices for lots from stock, tank steel, ¼-inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

Rails and Track Supplies.—There is a very strong demand for light rails, and the local manufacturer has sold its capacity for nearly three months ahead. Orders have also been placed for a few thousand tons of heavy sections. Demand for track supplies is heavy. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $39 to $40, with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

Merchant Steel.—There has been little demand during the week, the tonnage of contracts placed being of small proportions. Inquiries, however, are good and specifications of good volume. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 to 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—The demand for all sizes of pipe is

excellent and mills are booking a large volume of orders. We quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ⅜ in. inclusive	66.35	56.35	62.35	53.35
½ inch	68.35	58.35	65.35	55.35
¼ to 6 inches	72.35	63.35	71.85	61.85
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—There is no diminution to be noted in the orders for tubes, mills being well filled for several weeks ahead. Our quotations below are on carload lots, mill shipments, f. o. b. Chicago. On less than carload lots from mill, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	43.35	38.35
1¾ to 2½ in.	55.85	35.85
2¾ to 5 in.	60.85	45.85
6 to 13 in.	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—Buying continues light, orders being mainly for small lots. We quote f. o. b. Chicago, carload lots, 4-inch water pipes, $34; 6-inch, $33; 8-inch and upwards, $32; gas pipe, $1 a ton higher. On large orders these prices can be shaded.

Billets and Wire Rods.—Manufacturers and importers of billets report a very heavy demand, but owing to the scarcity of both the domestic and foreign product orders are hard to fill. Deliveries on German material cannot be made before the last quarter of the year, owing to the heavy demand upon German mills from home customers. We quote German basic Bessemer billets, $29 to $29.50 seaboard; domestic Bessemer billets, $31; open-hearth billets for rolling mill use, $31 to $31.50; open-hearth billets for forging purposes, $36 to $40; wire rods, $40.

Wire and Wire Nails.—Manufacturers report that the jobbing interests throughout the agricultural districts are sending in large orders for stocks and these are keeping mills well filled. The scarcity of billets is disturbing manufacturers, and the usual summer shut-down of various plants for repairs will be a welcome relief to a rather strained situation. Prices are firm. Our quotations to jobbers, Chicago delivery, are as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90. Staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; smaller lots, $2.70. Bale ties, 85 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—The local tracks are crowded with loaded cars, and spot coke is offered at $6.40 to $6.50. On contracts for future requirements, $4 to $4.35 at the ovens is asked. Demand is not very heavy.

Old Material.—Prices on all kinds of scrap continue their downward course and today are 50 cents to 75 cents lower than they were a week ago. There is little or no demand, and such sales as are made are forced. The weakness of demand for the finished product is largely responsible for the slump in scrap, although all dealers and mill men have long been of the opinion that the price of scrap was too high as compared with the price of the finished product. The reported meeting of scrap dealers at Indianapolis called for May 24 for concerted action to hold up prices is ridiculed in this city. Chicago dealers took no part in it and no action is expected from them. We quote gross tons as follows:

Old iron rails	$22 00 to 22 50
Old steel rails (mixed lengths)	16 50 to 17 00
Old steel rails (long lengths)	20 00 to 20 50
Relaying rails	29 50 to 30 00
Old wheels	20 00 to 20 50
Heavy melting steel	15 50 to 16 00
Mixed country steel	12 00 to 12 50

The following are selling prices per net ton:

No. 1 R. R. wrought	17 50 to 18 00
No. 2 R. R. wrought	15 00 to 15 50
Shafting	16 50 to 17 00
Dealers' forge No. 1	14 50 to 15 00
No. 1 busheling and wrought pipe	12 50 to 13 00
No. 1 cast	14 50 to 15 00
Heavy cast (300 pounds and over)	10 50 to 11 00
Railway malleable	15 00 to 15 50
Country malleable	13 00 to 13 50
Iron axles	22 50 to 23 00
Steel axles	18 00 to 18 50
Cast borings	6 50 to 7 00
Mixed borings, etc.	6 50 to 7 00
Wrought turnings	12 00 to 12 50
Machine shop turnings	12 00 to 12 50
Iron axle turnings	12 50 to 13 00
Steel axle turnings	12 00 to 12 50
Stove plate and light cast scrap	10 50 to 11 00
Old iron splice bars	18 50 to 19 00

Allan F. McIntyre, formerly with the Cambria and other structural mills, has taken an interest in two structural plants in Chicago and has opened offices at 510 Monadnock Block, for contracting and selling all classes of both plain and fitted structural material for building and other purposes, including plate and tank work.

The American Rolling Mill Co. contemplates dismantling its plant at Muskegon, Mich., and building a new one at Fort Wayne. Plans have not yet been made for the new plant, which will have a capacity of 35,000 to 40,000 tons of bars, bolts, nuts, chains, etc.

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, May 27.

The principal feature of the market for several days has been discussion of the conflicting reports concerning impending purchases of Bessemer iron by the United States Steel Corporation. The general expectation is that these purchases, in which J. G. Butler, Jr., of Youngstown, represented the furnacemen, will stimulate buying, and it is already reported that independent interests are figuring on meeting their requirements for Bessemer, but the effect on the general market is not yet apparent. A Cleveland furnace is reported to have sold 17,000 tons of Bessemer iron to the steel corporation at $18, f. o. b. furnace.

Iron Ore.—There has been a break in freight rates, several vessels having been chartered from the head of the lakes at 80 cents, or 5 cents below the rate established at the opening of navigation. The Pittsburg Steamship Co. is shipping ore rapidly, its shipments from the first of May to date being considerably in excess of those of the same time last year. This is not true, as a rule, of companies outside of the steel corporation, some of which find furnaces not at all anxious to have ore delivered, as many stockpiles are still far from exhausted. No sales of ore of any consequence are being made.

Coke.—Prices are very irregular and buyers are not showing any disposition to contract for the last half. Quotations of Connellsville foundry range from $4 to $4.50. It is understood that the Frick Coke Co. will furnish coke at $3 to those furnaces which have just sold their product to the U. S. Steel Corporation.

Pig Iron.—Agencies selling Southern iron report that association furnaces have so far declined to make prices below those recently announced, based on $17.50 for No. 2, Birmingham, and consequently are doing no business. The independent furnaces have sold a fair amount at from $15.50 to $16 for No. 2 Birmingham. It is believed that the association furnaces will soon come into the market at somewhat lower prices than those now asked. Recent inquiry as to the cost of manufacturing pig iron in the South develops that many furnaces in that section now have a cost ranging from $14.50 to $15, since labor and other costs have largely increased. No Northern foundry pig is being sold except occasionally small lots of spot, but foundrymen are showing a little more interest in the market. In response to an inquiry as to the condition of

the charcoal iron market, one of the principal producers makes this statement: "This company has such a large part of its product disposed of for the year that we have not really been in position to thoroughly test the market, although we presume if we should undertake to make large sales it would have to be done at somewhat lower prices than have been ruling. The charcoal iron market is in splendid condition, there really not being sufficient iron to fill the demands. We are having as much trouble in filling orders in accordance with the requirements of customers as we have had anv time this year, and see no hope for much change before September." We quote as follows, f. o. b. Cleveland:

Bessemer	$19 00 to 20 00
No. 1 Strong Foundry	21 50 to 21 75
No. 2 Strong Foundry	20 75 to 21 25
No. 3 Foundry	20 25 to 20 50
Scotch No. 1	21 50 to 21 75
Scotch No. 2	20 75 to 21 25
Gray Forge, Valley	19 00 to 19 25
Lake Superior charcoal	24 00 to 25 00

Finished Material.—The market is quiet. Although prices, as a rule, have held pretty firm, there are indications of weakness, as, for example, in structural material, on which agreement quotations for mill sales are as follows: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal mill plates, 1.70c. These prices at the mills have not been shaded, but some of the mills which have contracted for the sale of their product far in advance are not receiving enough specifications to keep their plants going and are rolling at times on current orders. When this is done, there is little chance for the jobber, and one firm which had a large stock on hand is selling beams and channels at 1.90c, although the usual price has been 2.15c. Even this sharp cut is said not to have brought the response hoped for. The price for steel bars, 1.60c for Bessmer and 1.70c for open-hearth, Pittsburg, is maintained, but little business is being done. The principal producers of bar iron are quoting 1.80c, Youngstown, but local mills are selling at 1.75c, Cleveland, and it is reported that that price has been shaded. Sheets, which were so long a cause of much trouble to the sellers, are now about the most satisfactory article in the market. The demand is good and competition is not so keen. The announced prices of the principal producer for sales through jobbers are as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock. No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

Old Material.—Dealers report that they have very little business and a great deal of trouble these dull days. Their efforts are confined to delivering on old contracts and trying to satisfy contract customers, many of whom are showing a disposition to reject material whenever a pretext for so doing can be found—and it is not usually difficult to discover something about scrap to which an objection can be made. Prices are largely nominal. We quote f. o. b. Cleveland, gross tons:

Old iron rails	$25 00 to 26 00
Old steel rail (over 6 feet)	22 00 to 23 00
Old steel rails (6 feet and under)	20 50 to 21 00
Old car wheels	24 50 to 25 00
No. 1 R. R. wrought scrap	22 00 to 22 50
Mill scrap	19 00 to 19 50
No. 1 machine cast scrap	18 50 to 19 00
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	17 00 to 18 00
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	10 00 to 10 50
Uncut wrought iron boilers	11 00 to 12 00
Steel boiler plates	18 00 to 19 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	19 00 to 20 00
Malleable iron (agricultural)	16 50 to 17 00
Stove plate	14 00 to 15 00
Heavy steel	20 50 to 21 00

CINCINNATI.

May 26.

Coke is easier and dull. For the best grades $4 f. o. b. ovens is the current quotation but for off qualities all sorts of figures are being quoted. Buyers are holding off and talking lower prices and very few contracts are being placed.

Pig Iron.—The developments of the past week have been slight and there is but little change in the situation. Prices are still irregular and a few sales, made under circumstances somewhat unusual, have established some low figures. A bid of $15 Birmingham for No. 2 foundry, after considerable dickering, was accepted, but there was difficulty in finding a furnace that would take the business at that price. The transaction covered 1,500 tons for delivery in the second half of the year. It seems that there is not so much low priced iron now available. Some of the furnaces that have been urging their offerings are now sold up to July 1 and they are not trying for business in the second half at bargain prices. It is reported that Ohio irons are easier and that prices are being made both by the Valley and Southern Ohio furnaces more nearly in line with Southern irons. The buyers of iron are still holding off and talking the market down.

The above briefly outlines the features of the market, but it must be said also that the current inside quotation for No. 2 foundry is $15.50 and this is difficult to shade on spot business. The disposition of sellers is more inclined to hold the market steady and the feeling prevails that bottom has about been reached. There are more inquiries coming in and buyers are watching the situation with considerable interest. The reported purchase of Bessemer iron by the largest consumer the past week has given rise to the belief that other buyers will follow. Every week is bringing the second half of the year nearer and the long hoped for buying movement is being looked for. The feeling, together with the attitude of the buyer who does not appear to be satisfied with any kind of a price, and does not indicate what figure would induce him to take hold, has caused the seller to hold off and let the market take its course. It is intimated that Southern association furnaces expect to hold a meeting in the near future. In the meantime they are maintaining their schedule so far as can be learned, although there are numerous stories afloat of some quiet work by certain interests who are reported to be taking some of the little business now to be had. Current quotations today are as follows f. o. b. Cincinnati:

Southern Foundry No. 1	$19 50 to 20 00
Southern Foundry No. 2	18 75 to 19 50
Southern Foundry No. 3	18 00 to 18 50
Southern Foundry No. 4	17 25 to 17 75
Southern Foundry No. 1, soft	19 50 to 20 00
Southern Foundry No. 2, soft	18 75 to 19 50
Gray forge	17 00 to 17 50
Northern foundry No. 1	20 00 to 21 00
Northern Foundry No. 2	19 25 to 20 00
Southern car wheel iron	26 75 to 27 75

Finished Material.—The market is fairly active in a jobbing way but there is no large business doing. Buyers are taking material only as they need it. Prices remain unchanged. Galvanized sheets are being quoted at 75 and 5 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c to 2.25c for base sizes. In merchant pipe there is no change in the situation. There is a fairly good steady trade and no change in prices. We quote:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12 inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	35.2
1¾ to 2½ inch	54.2	34.2
2¾ to 5 inch	59.7	44.2
6 to 12 inch	54.2	34.2

Old Material.—The market is easy and lower. Buyers and sellers are apart. Trade is quiet and dealers and melters are waiting the settlement of prices in pig iron. The following prices represent nominal values:

Old No. 1 railroad wrought, net tons	$16 00 to 17 00
Cast machine and foundry, net tons	14 00 to 15 00
Old iron rails, gross tons	19 00 to 20 00
Old steel rails, gross tons	17 00 to 18 00
Old short lengths, gross tons	17 00 to 18 00
Old iron axles, net tons	20 00 to 21 00
Stove plate, net tons	9 00 to 10 00
Wrought turnings, net tons	10 00 to 11 00
Cast borings, net tons	7 00 to 8 00

PHILADELPHIA.

May 26

There is no improvement in demand. It is very rare, however, to find a mill which is not working to its full capacity, and there is nothing alarming in present conditions. Considering the large increase in production of pig iron, the decline in prices has been very moderate and there is nothing to indicate that they will go much lower. Sellers would welcome a somewhat lower basis for prices to stimulate business, but they are not agreed as to just what action they should take.

Pig Iron.—Consumers seem to have all the iron they need for a considerable time and appear to be absolutely indifferent about present conditions. Prices are more or less nominal, but for June and July deliveries are about as follows: No. 1 X foundry, $21 to $21.50; No. X foundry, $19.50 to $20; No. 2 plain, $19 to $19.50; gray forge, $19 to $19.50; Middlesboro, No. 3, $19.50 to $20; basic, $19 to $19.50; Middlesboro in cargo lots, $16.75 to $17.

Finished Material.—The demand has fallen off, and there is sharp competition. Prices are unchanged, but the feeling is unsettled. We quote: Best refined bar iron, delivered, 1.85c to 1.90c; tank plates, steel, 1.75c to 1.80c; angles, 1.75c to 2c; beams and channels, 15 inches and over, 1.75c to 1.90.

Old Material.—Steel scrap is being bought in limited quantities. Otherwise there is no demand. We quote: Old steel rails, $21.50 to $22; miscellaneous heavy steel scrap, $20.25 to $20.75; low phosphorus scrap, $28 to $29; old steel axles, $26 to $26.50; old iron axles, $28.50 to $29; old iron rails, $24 to $24.50; old car wheels, $22.50 to $23; choice scrap, R. R. No. 1, wrought, $22 to $23; country scrap, $19 to $20; machinery cast, $19 to $20; No. 2 light scrap (forge), $18 to $18.50; No. 2 light scrap (ordinary), $14 to $15; wrought turnings, $16 to $16.50; wrought turnings, choice heavy, $17 to $18; cast borings, $11 to $11.25; stove plate, $15.50 to $16.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST. May 26.

Pig Iron.—The event of the week in pig iron circles here was the official announcement yesterday that the United States Steel Corporation had purchased Bessemer iron in a considerable quantity for the third quarter on the basis of $19.35, Pittsburg. Officials of the company were not willing to indicate the tonnage taken, but stated that all that was offered was bought and that they will have to purchase considerably more. The result of this buying has been to impart a steadier undertone to the pig iron market in general. Consumers of foundry iron pursued during the week the same policy they have followed for weeks, of only buying to meet immediate requirements. Founders are awaiting with interest the outcome of a conference of the associated Southern furnaces which will probably be held next week in this city, and at which some further developments regarding prices for the last half are expected. Schedules made a few weeks ago are being rigidly lived up to, but it is well known that outside furnaces are disposing of their output for that period at from 50 cents to $1 a ton less. Yet consumers in this vicinity do not show any disposition to avail themselves of the opportunity thus presented, and still think it will be profitable for them to withhold their orders for the time being. Prices for both Northern and Southern brands for immediate delivery show a wide range. On the whole, it would seem as if values were easier than at last report. Foreign irons are dull, and no new business has been placed. Cables and private mail advices denote a greater willingness on the part of producers to meet the cuts recently made on American brands. New York prices at tidewater are as follows: Northern No. 1, $20.50 to $21; No. 2 Northern, $19.50 to $20.50; No. 2 plain, $19 to $20; Southern, No. 1 foundry, $20.25 to $21.75; No. 2 Southern foundry, $20 to $20.75; No. 3 Southern foundry, $19.50 to $20.25; No. 4 Southern foundry, $19.25 to $19.75.

Rails.—Trade is mostly confined to lots up to 1,000 tons, with street railway interests large buyers. The mills are being heavily pressed for urgent deliveries. Reports that railroads are or were anxious to cancel some part of their orders are without foundation. As a matter of fact all of them are clamoring for the execution of their orders as quickly as possible.

Billets.—Quibbling over price or delivery of German Bessemer basic billets interferes with the closing of some excellent business. Inquiries are reported good, and prices are from $28 to $28.50, according to delivery.

Finished Iron and Steel.—The disturbances in the labor world still affect the finished material market, although more inclination to give orders was shown during the past week. Contracts closed by the American Bridge Co. during the week include 30,000 tons for new buildings of the National Tube Co. at McKeesport, Pa., and Lorain, O.; 4,000 tons for the Federal Sugar Co. at Yonkers, N. Y.; and 2,000 tons for the Van Norden Trust Co. building, New York City. Sheets continue dull, and jobbers are selling at concessions. Bar iron is weaker, although some old established houses quote prices recently ruling. Plates are without particular interest, but it would seem as if mills will have less difficulty in filling future orders than they anticipated. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; firebox, 2.30c to 2.50c; refined iron bars, 1.85c to 2c; soft steel bars, 1.75c to 1.85c; steel sheets, in carloads, New York, No. 28, black, 2.90c to 3c; galvanized, 75 and 2½ off.

BIRMINGHAM, ALA.

May 26.

There is no doubt that furnacemen throughout the district realize that quotations of coke iron at $17.50, Birmingham, for No. 2 foundry are at least $1 per ton higher than would ordinarily be termed the Birmingham market price. Still, it is claimed association prices are being strictly adhered to by interested parties, and as a consequence few or no sales are being made. One Northern consumer came in the market the past week for about 2,500 tons, desiring to purchase a special Southern brand. It is understood the order went to Northern furnaces at about $16 Birmingham basis, as association prices could not be reduced. There has been a good inquiry for a week or ten days, but the prices asked have not resulted in much business. Coke was lower the past week than it has been for eight months. It is reported good supplies of 72-hour coke can be obtained at $4.50 to $4.75 at the ovens. Coal prices have receded materially from the high figures that prevailed during the winter months. Run-of-mine coal now brings from $1.15 to $1.30 at the mines, owing to quality and nature of the coal.

The Weller Rolling Mill & Forge Co. has purchased and will operate the old Anniston Rolling Mill Co. property at Anniston. It is expected that the new owners will overhaul the old plant, increasing its capacity to about 45 tons of finished iron per day. It is proposed to add a forge.

The South Pittsburg Coal & Iron Co., recently organized by Walter Kennedy and others, has secured options on several thousand acres of coal and iron ore lands north and northeast of Birmingham. If these options are exer-

cised, it is expected that one or more furnaces will be erected in the vicinity of Boyles Station, five miles above the city, but this is altogether problematical.

The Warrior River Navigation Company was incorporated the past week by local capitalists, with a view of aiding in bringing about the construction of a canal from Village Creek through Birmingham to the Warrior River above Tuscaloosa. Strong efforts are being put forth to give Birmingham an outlet by water for its coal and iron and finished products.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
Room 1909, No. 150 NASSAU ST., May 26.

Pig Tin.—Bearish interests in London were quite active during the week, and declines were recorded daily, the most notable occurring yesterday when spot and futures in London sold off £4 5s and £2 15s respectively, followed by a break in this market of similar proportions. The net decline in prices here for the week amounts to 1¼ cents. The weakness in the metal is solely due to an accumulation of stocks, and to bearish trade reports. Closing prices today at the Metal Exchange were as follows: Spot to June, 28⅛c to 28⅜c. London's closings today follow: Spot, £128 5s; futures, £126 5s. Arrivals at Atlantic ports for the month to date aggregate 2,687 tons, with 3,924 tons afloat.

Copper.—No new developments of interest can be noted for the week. Prices continue nominal, and buyers have either provided for their wants for several weeks to come, or are waiting for lower prices before doing so. The former explanation for the market's dullness is generally given. In London, during the week, the market was feverish, and closing prices today represent a net decline of nearly £2 in both spot and futures. Closing prices at the Metal Exchange today were as follows: Lake and electrolytic, 14¾c to 15c; casting, 14½c to 14¾c. London closed today as follows: Spot, £60 7s 6d; futures, £59 10s. Exports for the month to date amount to 7,292 tons.

Lead.—Is dull at 4.37½c for lots of 50 tons or more. St. Louis slightly lower at 4.15c, as is London at £11 12s 6d.

Spelter.—Is quiet and steady at 5.75c for spot. St. Louis is 5.50c, and London £20 15s.

Antimony.—Cookson's unchanged at 7¾c to 8c; Hallett's at 7c. Other brands are 6¾c.

Quicksilver.—Still quoted at $47.50 per flask of 76½ pounds in lots of 100 flasks. London unchanged at £8 2s 6d.

Nickel.—In good request at 40c to 47c for large lots down to a ton, and 50c to 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, May 26.

The metal market continues weak, demand being reduced to a minimum. Pig tin has fallen off 1 cent a pound. We quote Lake copper, carload lots, Chicago delivery, 14¾c to 14⅞c; smaller quantities, 15c. Pig tin, 30c; pig lead, 4.30c in 50 to 100-ton lots, and 4.32½c in lesser quantities; spelter, 5½c in carload lots, and 5¾c to 6c in lesser quantities; sheet zinc, 6¾c; antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's. We quote old metals as follows: Copper wire, 12¼c; heavy copper, 12c; light copper, 11½c; heavy red brass, 12c; heavy yellow brass, 9c; light brass, 8c.

Col. Albert A. Pope, the well-known bicycle manufacturer, has taken over the assets of the American Bicycle Co., and announces that he will open the works closed by the company, numbering some forty concerns in various cities. The reorganized company is called the Pope Mfg. Co.

The Puget Sound Iron & Steel Works, Tacoma, Wash., have leased for a short period the machine shop of the Hardy Shipbuilding Co. of that city. The Hardy Ship Building Co. discontinued the use of this plant on Sept. 2, 1902.

"A MILL MAN" ON THE SITUATION.

To the Editor:

The conditions in the iron and steel trade at the present time are exciting more than general interest because of the decided bearish sentiment that is abroad in the land. Much of this talk is unwarranted by the facts. While the buying of both raw and finished products has fallen off to a certain degree, and while this lull has affected prices in some lines for the time being, it cannot be said to have materially weakened the market. The iron and steel trade has a basic strength far in excess of that credited to it by the public, and all this talk of lower prices and less demand is purely superficial. It is the most natural thing in the world that after a storm there should come a calm; and the present quiet period, which is temporary at most, was to be expected after the abnormal activity that has existed for the past two years. Prices are merely seeking their normal level, and when this is accomplished there will be a resumption of activity all along the line. There is no foundation in fact for a weak market.

The railroads, the largest consumers of iron and steel products in this country, are earning more money than ever before, because there is more traffic in transit than ever before. Their facilities have been increased and are still being added to, resulting in more despatch in the delivery of material tendered them to transport. All of the large manufacturing companies have in the year past also increased their facilities, and are therefore in much better position today to supply their customers' demands promptly. The increased facilities of both manufacturing and transportation companies, affording much better delivery of iron and steel products to consumers, have prompted the average buyer to conclude that demand is falling off, and as supply and demand control prices in the end, he feels that the turn has come and that all that is necessary for him to do is to wait and he will buy material for less price than he can purchase it today. This waiting, which has been going on for the past four months, and the reduction of stocks on the part of all manufacturers and dealers resulting from this action, have had the effect of taking up a lot of the "slack," as it were, that existed. That is to say, the mills have not been called upon to furnish material in the volume that they were in all of the months of last year, during which time people were ordering from 25 percent to 50 percent more than they really needed for the time in which they placed their orders, because of the congestion which interfered with the prompt delivery of material. Now, on the other hand, they have recently been ordering only 75 percent of their actual requirements, working up the stock on hand and filling in odds and ends from jobbing houses, feeling that it is to their advantage to do this, as the chances are all, as they see it, in favor of lower prices. While it is absolutely true there was over-specifying and over-buying last year, the exact reverse condition is present today—under-buying and under-specifying. This proceeding will produce a shortage again within the very near future, provided the crop prospects are not blasted and the strike fever subsides. The foundation of prosperity in this country for the past four years has been the crops, and without good crops no continuous prosperity ever has or ever will exist.

While some products of iron and steel have been abnormally high, and while necessarily there will be some readjustment of prices with relation to other iron and steel products, yet, until there is a general crop failure, or a more than partial failure, the wave of prosperity will roll on. Prices of steel products are firm, and it is generally conceded there will be no change within the year. Bar iron prices have been somewhat irregular and have been cut quite a little by mills scattered throughout the country in their efforts to secure sufficient tonnage to enable them to run to their maximum capacity. The statistical position in iron and steel, however, is certainly very strong, inasmuch as there are no large stocks of iron and steel, finished or raw material, in the hands of either producers, distributers or consumers. A clearing up of the strike situation, coupled with a successful crop this year, which is practically assured, means that an enormous business is to be done this fall, which will tax the capacities of all the producers to manufacture and the railways of the country to transport.

A MILL MAN.

Chicago, May 26, 1903.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

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MAY 28, 1903.

AT OUTS WITH IRON TRADE PROSPERITY.

A number of manufacturers of farm implements, not including the principal company, are reported to be circulating a petition to be presented to President Roosevelt, asking relief from alleged oppression of certain so-called trusts, particularly the "steel interests." A number of remarkable charges are made, including the following:

"That the public's unsuspecting tendency is to look upon the mighty steel interests as merely one of the 'fellow and co-operating manufacturing industries' with other manufacturing industries of the country;

"That with this common misunderstanding the present steel trust has enjoyed a license that has allowed it to rise up as a mighty power for not only threatening and hazarding the success of all metal using manufacturing in the United States, but even now to threaten the life and existence of such factories, besides doing untold injury against the commercial success and progress of our country in numerous ways;

"That these steel industries now own a large percent of our iron furnaces, and have caused the price of iron and steel materials to advance enormously since the forming of the steel trust; as one example, the pig iron that was purchased a few years ago at from $12 to $14 and $16 is now costing us from $24 to $20 and $28, with many questionings and demands at these high prices that further tend to their net delivered expense;

"That, whereas, in recent years past we have been heretofore able to order our stock one month and to expect a delivery of the material the following month; that we are now required to order six, eight and ten months, and even longer ahead, for every class of these materials, thus compelling us to carry enormous high-priced stocks for manufacturing purposes, or otherwise find ourselves running out of many different requirements at the season of manufacturing."

According to the above charges, kindly made for the purpose of enlightening an unsuspecting public, the crime contemplated by the producers of steel is the unnatural one of murdering their own customers, after which, in order to market their products, they would be compelled to carry on all the manufacturing now done by all metal using concerns in the country! Such a proposition is too preposterous for serious consideration. As to the further charge that our iron and steel manufacturers propose to do untold injury to the commercial interests of the country, the complaint of the petitioners that they have been unable to obtain prompt deliveries is a complete answer, for this delay was due to the prosperity of the country. How the producers of steel can be blamed because the railroads have been unable to meet the tremendous demands upon them, the petitioners would find it difficult to explain.

There is no more force in the statement that the "steel interests" have raised prices than in numerous other allegations in this strange document. The example of pig iron cited is peculiarly unfortunate because the steel corporation, which is especially charged with wrong doing, is a buyer and not a seller of pig iron. If, however, the petitioners had gone into the finished material lines for examples, they probably would not have found much to help them, because it could be readily established that on nearly all kinds of finished material turned out by the corporation, independent producers, during a considerable part of the past year, have received higher prices than did the corporation, while the influence of the latter has steadily been exerted in opposition to forcing the market to too high a plane.

If the unknown sponsors for this complaint against prosperity and its effects consider prompt deliveries and low prices to be the chief desideratum, they may recall that these were prominent features of our industrial life in the years between 1893 and 1898. We have now had about five years of prosperity, and it has been the general impression that manufacturers desired to have the period extended. The guess may be hazarded that the inspiration of this remarkable document, with its reckless perversion of the facts—none more notable than its citation of pig iron prices—is some division of the free trade army; and if this be so, the complaint against prosperity in iron and steel manufacture can be well understood.

SUCCESS FROM KNOWING MEN.

Two recent events have emphasized the fact that knowledge of men and interest in men have been a most important factor in contributing to the success of Andrew Carnegie and those associated with him. Mr. Carnegie's inaugural address as president of the Iron and Steel Institute was a powerful appeal for just relations between employer and employe; but even more significant was the language he used as he handed a proof of his address to Editor Wm. T. Stead:

"Here is the sermon. I am not a technical expert. I know nothing of scientific metallurgy. The only piece of machinery I know anything about is man. It is a complicated machine, but I've been studying it all my life."

In his address at the dedication of the Free Industrial School at Homestead, his own gift, Mr. Carnegie's former lieutenant, the president of the United States Steel Corporation, said:

"I doubt if any man or woman here can appreciate how deeply this demonstration goes into my heart, or what a lasting impression it will make. I verily believe that no honor can come to any man that will give him more genuine pleasure and satisfaction than to know that the people with whom he was so long associated and from whom he has been more or less separated, still retain their love and affection for him. I want no prouder epitaph than to have it truly said that 'the working people with whom he worked loved and honored him.' I never say, 'the man who worked for me;' the men of Homestead always worked with me."

In these days of industrial restlessness and conflict, it

is pleasant to read such utterances as those of Carnegie and Schwab and to hope that they will influence employers and employes to realize that too often a fundamental cause of bitterness and strife is a failure to understand each other.

The recent publication of the statistics of wire rod production in the United States in 1902 shows to what a large extent the steel corporation controls the output of wire products. The American Iron and Steel Association's figures give a total production of 1,574,393 gross tons of wire rods in the United States last year. The steel corporation's report of its output of various products in 1902 gave 109,330 tons of rods marketed as such, and 1,122,809 tons of wire products, the total being 1,232,139 tons. As the waste in converting rods into wire and nails may be considered negligible in this calculation, it appears that the corporation now produces 80 percent of the wire products of the country. The Union and Sharon plants were not acquired until December, but we assume that their production for 1902 is included in the corporation statement given above, as they were under its control at the close of the calendar year. Neither plant made an output at all approaching its capacity in 1902. Together their rod mills could produce about 300,000 tons in a year; so that the dominance of the steel corporation in the wire and wire nail industries is more marked than the figures for 1902 would indicate.

Personal.

The United States is represented in the list of 99 new members (29 of these outside of Great Britain) elected at the last meeting of the Iron and Steel Institute by the following: Frank C. Roberts, Philadelphia; Frederick F. Lines, Sparrow's Point, Md.; Camille Mercader, Carnegie Bldg., Pittsburg; Leonard Peckitt, Empire Iron & Steel Co., Satasauqua, Pa.; Richard Peters, Jr., Chester, Pa.; Johann Otto Trotz, 71 Broadway, New York.

Henry R. Cornelius, of Pittsburg, for many years direct representative of the Southwark Foundry & Machine Co., of Philadelphia, has taken entire charge of the output of the Brown Corliss Engine Co., in the Pittsburg district. He has opened up offices in the Frick Building. Mr. Cornelius has spent a great deal of time in the mills and works at Pittsburg, and is an authority on rolling mill and blowing engines.

Henry C. Newburgh, of Columbus, O., will hereafter represent the Field-Evans Iron Co., in certain central territory, including Columbus. His headquarters will be at Room 308 M. & M. Bank Bldg., Columbus.

Thos. Morrison has resigned as general superintendent of the Edgar Thomson blast furnaces and steel works, and is succeeded by Chas. E. Dinkey, formerly his assistant. Mr. Dinkey will appoint his assistant himself, other changes necessary at the works being made and passed upon at the general office. Mr. Morrison will sail for Europe about June 1 and will take a long vacation.

R. A. Hadfield, of Sheffield, Eng., recently arrived in New York.

A feature of the social functions of the week of the Iron and Steel Institute meeting in London, this month, was the presentation to Andrew Carnegie of the freedom of the Worshipful Ironmongers' Company. The casket in which the freedom of this historic organization was presented was made of charcoal wrought iron, finely polished and mounted with wrought hinges, hasps, shields and strappings.

The Kentucky Wagon Co., Louisville, Ky., has placed an order with the Ball Engine Co., Erie, Pa., for a 150-h. p. self-oiling engine arranged for direct connection to a James Clark, Jr. & Co. generator.

The New York office of Joseph T. Ryerson & Son has changed address from 22-24 State St., to 17 State St., Chesebrough Bldg.

GOOD RECORDS AT CLAIRTON FURNACE.

Furnace No. 1 of the Clairton Steel Co., at Clairton, Pa., closed a remarkable week's production at 6 a. m. Monday last, May 25. The day after was five weeks since the furnace was blown in. The production was as follows:

May 18	512 tons
May 19	490 tons
May 20	495 tons
May 21	530 tons
May 22	520 tons
May 23	540 tons
May 24	560 tons
Total	3,647 tons or 521 tons daily.

The furnace is 85x21 feet, being designed particularly for the use of Mesabi ores. The company's ores are of better physical structure than the average of the Mesabi range. The furnace was blown in April 21, using 100 percent Mesabi ore. The week's record noted above was made on about 92 percent Mesabi ore and about 8 percent silicious ores.

The company's steel plant has been doing very well. Only 10 of the 12 open-hearth furnaces are in use, and on Saturday, May 23, these 10 furnaces made 1,165 tons of ingots. The blooming mill is working up to a thousand tons a day, but a small part of the product still has to be shipped as ingots.

Obituary.

Lot Davies, one of the most prominent charcoal iron manufacturers of Southern Ohio, died at his home in Jackson, O., May 17, aged 73 years. He was born in Wales, was brought to Gallia County, O., by his parents when a lad, and was first employed in furnace work in 1847. He rose from a very humble beginning to the management of several furnaces. His last service was as manager of the Jefferson furnace at Oak Hill, Jackson county. He had an honorable record as a soldier in the Civil war. In 1897 he was elected a member of the Ohio House of Representatives and served for two terms.

Henry A. Lozier, who for a number of years, was a prominent manufacturer of bicycles, died May 25, in New York city. Mr. Lozier organized the Cleveland Bicycle Co., of Cleveland, and managed it successfully. Four years ago, when the American Bicycle Co. was organized. Mr. Lozier sold his interests to it and began the manufacture of gasoline engines for automobiles and launches, building a large plant at Plattsburg, N. Y.

Thomas McGregor, founder of the Central Boiler Works, Detroit, died May 18th, aged seventy-five years. He was born in Glasgow, Scotland, and emigrated to this country, in 1846. After spending a year in Toronto and a year in Buffalo he went to Detroit, where he lived from that time.

Steel Castings of 165,000 Pounds Each.

A number of Pittsburg engineers were entertained by C. L. Hastings, sales agent of the Bethlehem Steel Co., at Pittsburg, by a trip to the Bethlehem works the latter part of last week. The party left in a special car Thursday night and returned Sunday night. Friday and Saturday was spent in an inspection of the plant. The most interesting work seen was the parts of the 12,000-ton armor plate press for the Carnegie Steel Co., two steel castings of which weigh 165,000 pounds each. These are among the largest castings ever made.

The machinery plant of the Mossberg & Granville Mfg. Co., Providence, R. I., has been closed, and creditors of the firm have received notice that in connection with the plan of reorganization and by agreement of all parties concerned, a petition of bankruptcy has been filed in New York. The total liabilities are placed at $1,269,000, with assets other than patents estimated at $200,000.

The Forest City Steel & Iron Co., Cleveland, has made a contract with the Toledo Portland Cement Co., Toledo, for the structural steel for its new plant at Manchester, Mich.

The Labor Situation.

STRIKES AND SETTLEMENTS AT CHICAGO.

CHICAGO, May 26.—The white dove of peace seems yet a long way off from Chicago, and the developments of the past week indicate that it will be some time before the fluttering of its wings will be heard in this city. The industrial unrest that within the last year has swept the workingmen and women of Chicago into labor organizations has practically reached a crisis, and the remaining days of this month will determine whether there will be peace or tumult in this city. The freight handlers engaged on all the railroads centering in Chicago, numbering about 9,000 men, strongly organized, are the latest to make demands for an increase in wages, with the alternative of a general strike June 1 should the same not be granted. That it will be granted is extremely doubtful, for at a meeting of the managers of 24 roads, it was unanimously agreed not to make the concession, the following resolution being adopted at the meeting:

Resolved, That each railroad company in the association advise its freight handlers that their request for an increase of 25 percent in wages and other demands have been carefully considered, and in view of the increase of approximately 15 percent granted about a year ago a further advance can not be conceded.

The railroad managers also issued the following statement to the public:

The limit of unreasonable exaction has been reached in the demand of the railway freight handlers for a 25 percent increase of wages.

To begin with, the freight handlers include no high grade of labor, and their minimum scale of wages, $1.70 a 10-hour day in Chicago, is the highest paid to their class in any city in the United States except San Francisco and possibly a few mining towns. Their employment is regular, and there is no Sunday labor and little extra work, for which, when it is required, extra pay is allowed. Bare ability to decipher marks and addresses is all the education demanded.

The present rate, which often includes free transportation to and from work, was reached as the result of the two so-called settlements in 1902. In April the rate was advanced from $1.50 a day to $1.60, and in July, after the strike, to $1.70, making an average advance of about 15 percent in three months.

The present demand for a 25 percent raise is equivalent to an advance of 43 percent over the scale paid fourteen months ago.

Not only are the railways paying a rate of $1.70 for work that formerly cost $1.50 a day, but they do not get as much service from the same men for the increased wage, and the number of employes has had to be increased at increased pay.

In the matter of meeting demands for higher wages the railroads of the country find themselves in a sorry fix. They have the interstate commerce commission at their back forbidding the raising of rates to meet the tide of rising wages, materials, and everything that enters into the cost of operating and maintaining roads.

In the meantime public sentiment is misguided, and the natural desire of railway employes to share in the general prosperity is fomented into preposterous demands by the continued parading of "increased gross earnings" of different railway systems. But in the general booming of gross earnings and prosperity few stop to inquire what the net earnings. Outside of the financial chronicles who pays any attention to the fact that with an increase of $4,353,946 in gross earnings for the nine months of the current fiscal year over the previous year the net earnings of the New York Central only increased $229,836, while the Illinois Central, which showed an increase of $2,506,182 in gross earnings for the nine months to March 31, actually had a decrease of $65,336 in net earnings for the same period.

The railway officials hope that when the actual conditions are understood the freight handlers will withdraw their demands, and not force an issue where the practical limit of concession has been reached. It is certain that if the freight handlers decide to strike it will tie up the entire freight business of Chicago with disastrous effects throughout the network of railway systems centering here. In the face of the recent repudiation of the findings of arbitration boards by labor unions the roads feel that their employes are almost estopped from appealing to a means of settlement where one of the parties would have to be put under bonds to abide the verdict for at least twenty-four hours.

Should the freight handlers go on strike, as their leaders propose, it will result in as complete a paralysis of trade in this city as it suffered last year during a strike by these men. The railroads are receiving assurances from many business houses that their struggle with the union will receive the latter's moral support and co-operation, and arrangements are being made to switch freight at other junctions and to bring in large bodies of men to take the strikers' places should a lockout be ordered. Some railroad officials even talk of calling for United States troops should the arrival and departure of trains be interfered with.

There appears to be no end to the demands of workmen in this city, and the strike virus is inoculating all branches of industry. No sooner are the demands of one set of workmen adjusted than another body of men engaged in some other trade or line of work present ultimatums, fully 20,000 men and women being idle as a result.

International Harvester Co.'s Position

The agreement made between the International Harvester Co. and the committee representing the various unions, is as follows:

The International Harvester Co.'s Chicago factories will not discriminate against employes who belong to a union, but there shall be no interference by persons representing organized labor for any purpose whatever during working hours.

All grievances of employes may be presented to the company by the employes or their committee, on the distinct understanding that there will be no prejudice to employes making complaints, or because of serving upon a grievance committee.

All old employes will be given the preference in employment.

Any new building done by the company will be done by contract or under the rules now existing between the Carpenters' and Builders' association of Chicago and the Carpenters' council.

All overtime shall be paid for at the rate of time and a quarter up to 12 o'clock, midnight, and double time shall be paid thereafter and for all Sundays and legal holidays. Regular night work will be treated as overtime, unless done by the night shift. The complaints regarding fans, seats, toilet rooms, etc., will be adjusted. Profane or obscene language to employes is strictly prohibited, and this rule will be enforced. A pay station for twine works employes will be arranged.

It is hereby agreed that fifty-five hours shall constitute a week's work until Jan. 1, 1904, at the same wages now paid for sixty hours; and thereafter nine hours shall constitute a day's work, at the wages now paid for ten hours.

Above to cover the company's manufacturing year, ending Sept. 15, 1904.

The strike at the Fraser & Chalmers works of the Allis-Chalmers Co. has been settled, and the plant started up again The electricians and cranemen, who caused the shutdown, received a 10 percent increase in wages with the nine-hour day. To prevent a recurrence of these intermittent strikes, the Allis-Chalmers Co. concluded agreements yesterday with all the labor unions in this city represented among its workmen, by which the latter bind themselves not to strike or formulate fresh demands before May 1, 1904. By this agreement the company is assured of the continued operation of its plants without interference for the ensuing year.

Chicago Metal Trades Association Agreement.

The Chicago Metal Trades Association also made an agreement yesterday with the metal workers, which provides for the nine-hour day and a sliding increase in wages. The agreement is signed by a committee of the manufacturers and a committee of the Chicago Metal Workers' Council No. 1 of the United Metal Workers' International Union. It will be seen that it provides for "open" shops:

Article 1. It is hereby understood and agreed by and between the parties hereto that the standard working time shall be nine (9) hours per day.

That any member of the Chicago Metal Workers' Council No. 1 who has been continuously employed in the plant of any member of the Chicago Metal Trades Association from Jan. 1, 1903, up to the present time, whose present wage rate per hour on day work is twenty-four (24) cents or under shall receive a ten (10) percent increase in wage rate on day work above that paid him Jan. 1, 1903. Any member of said Council receiving over twenty-four (24) cents and under twenty-eight (28) cents per hour on day work shall receive a five (5) percent advance above the day rate paid him Jan. 1, 1903. Those getting twenty-eight (28) cents per hour and over shall receive two and one-half (2½) percent advance on their day rate.

Members of said Council employed after Jan. 1, 1903, and

previous to April 21, 1903, who are now getting hourly wage rates of twenty-four (24) cents and under on day work, shall be advanced ten (10) percent above the rate paid them when first employed; those getting more than twenty-four (24) cents and less than twenty-eight (28) cents per hour on day work shall receive an advance of five (5) percent over the rate paid them when first employed.

Article 2. The following shall be the minimum wage scale to apply to conveyor departments of shops of members of the Chicago Metal Trades Association:

Mechanics, first-class	35	cents per hour
Machine Hands	25 and 28	cents per hour
Floor Hands	28	cents per hour
Bucket Bench	25	cents per hour
Crane Men	25	cents per hour
Helpers	22½	cents per hour
Rivet Heaters	16	cents per hour

Article 3. That time and one-half shall be paid for overtime, and double time shall be paid after 12 o'clock, midnight, also for Sundays and the following legal holidays: New Year's Day, Decoration Day, Fourth of July, Thanksgiving Day, Christmas Day, and under no circumstances will a member of the Chicago Metal Workers' Council No. 1 be compelled to work on Labor Day.

Article 4. No discrimination will be made against any man because of his membership or non-membership in the United Metal Workers' International Union, Council No. 1. Every workman who elects to work in a shop will be required to work peaceably and harmoniously with all his fellow employes.

Article 5. There shall be no limitation or restriction of output in any of the plants of the members of the Chicago Metal Trades Association by the Chicago Metal Workers' Council No. 1, nor shall any further demands be made on the Chicago Chicago Metal Workers' Council No. 1 during the life of this agreement.

Article 6. It is further understood and agreed by and between the parties hereto that this agreement shall remain in full force and effect from Jan. 1, 1903, to April 21, 1904, and if either party shall desire a change in the agreement at the expiration of said period notice shall be served upon the opposite party at least 30 days prior to the expiration of this agreement.

Article 7. Any differences or disputes arising between parties to this agreement that cannot be settled by committees representing the parties hereto, shall be settled by arbitration in the following manner: By the party of the first part selecting one member of an arbitration committee and the party of the second party selecting a second member of said committee, and the two so selected to select a third member of said committee, which will form an arbitration committee of three; the decision of this committee to be final and binding on both parties to this agreement; it being further understood and agreed by both parties to this agreement that up to and during the time the aforesaid arbitration committee may have the matter under consideration no strike or lockout shall be declared by either party to this agreement; the decision of said arbitration committee to take effect and be in force from the day said committee went into session.

STRIKE IN ST. LOUIS METAL TRADES.

St. Louis, May 26.—A strike involving about 2,000 machinists, metal polishers, brass workers, blacksmiths and other metal workers is on in this city. The manufacturers in these trades had had many meetings in April and May with the conference board of the machinists, brass workers, blacksmiths and pattern makers, using every endeavor to arrange satisfactory agreements for the ensuing year. These deliberations were successful on all points except that of wages. The employes demand an increase of from 10 to 20 percent. The St. Louis Metal Trades Association received reports from all of the principal manufacturing centers in the country and found that the existing rate of wages in St. Louis was higher than in any competing cities. Nevertheless, on account of local conditions in St. Louis, brought about by the preparations for a world's fair there, the manufacturers offered to increase wages 6 percent, and coupled this offer with a proposition to submit any question, wages included, to arbitration. The machinists' and brass workers' unions refused these offers and went out on a strike on May 20. The blacksmiths and pattern makers agreed to leave the matter to arbitration, and stated that their members would not strike unless forced to do so, by conditions becoming unbearable. They, however, called their men out 24 hours after the machinists went, so that now the city is completely tied up by a strike of all the metal workers, excepting the molders.

The St. Louis Metal Trades Association is composed of 57 firms, employing machinists and kindred trades. This association stands on its proposition to grant 6 percent increase in wages, pending arbitration, and to arbitrate any question which may be in dispute. The machinists' organization made the proposition on May 23 that if the manufacturers will grant 10 percent pending arbitration the men will return to work, but as 10 percent is all the machinists have ever asked, this request was refused. All the members of the St. Louis Metal Trades Association have signed an agreement, in which they delegate to a committee of the association full power to handle the strike, each firm agreeing to take no individual action. The following communication was addressed to the employes:

To Our Employes: We have received from some of our employes a demand for 10 percent increase in wages. In declining that request we wish to explain that we have offered an increase of 6 percent and have offered to submit this or any other difference to arbitration. The machinists' and brassworkers' unions have refused all arbitration with our association. In order to act fairly and intelligently on the wage question we have sent inquiries and received reports from employers in a large number of competing cities, and have found that the present wages paid in St. Louis are materially higher than paid in other localities. In offering an advance of 6 percent we have aimed to be liberal.

We ask that our employes remain at and return to work and submit any matters in dispute to a board of arbitration.

By order St. Louis Metal Trades Association.

FERD SCHWEDTMANN, President.

St. Louis, May 20.

LABOR BUREAU IN THE MACHINE TRADE.

Cincinnati, O., May 25.—A conference on one of the most important features of the work of the various local associations affiliated with the National Metal Trades Association was held in this city May 21 and 22 in the rooms of the Cincinnati Metal Trades Association. Those who attended were the guests of the Cincinnati association, and following the sessions at the association's headquarters, there were various forms of entertainments. Among those in attendance were the following; F. A. Geier, of the Cincinnati Milling Machine Co.; Ernest F. DuBrul, commissioner of the National Metal Trades Association; Robert Wuest, secretary of the National Metal Trades Association, and Philip O. Geier, Deputy Commissioner of the National Metal Trades Association, from Cincinnati; C. E. Hildreth, of P. Blaisdell & Co., Wooster, Mass.; F. D. Wanning, of the Birmingham Iron Foundry, Derby, Conn.; F. H. Stillman, of the Watson-Stillman Co., New York; F. A. Sheffler, of the Marine Engine & Machine Co., Harrison, N. J.; H. C. Hunter, secretary New York Metal Trades Association, New York; P. B. Kendig, Seneca Falls Mfg. Co., Seneca Falls, N. Y.; W. Grant King, Iroquois Iron Works, Buffalo, N. Y.; A. Falkenau, of Falkenau-Sinclair Machine Co., Philadelphia, Pa.; William Lodge, of the Lodge & Shipley Co.; H. M. Morris, of the Bickford Drill Co.; A. C. Fischer, secretary of the Cincinnati Metal Trades Association; J. C. Hobart, of the Triumph Electric Co., of Cincinnati; D. B. Kirk, of the C. & G. Cooper Co., Mount Vernon, O.; W. D. Sayle, of Cleveland Punch & Shear Works, and Thomas M. Roche, secretary of Cleveland Metal Trades Association, of Cleveland; Edward C. Wells, Quincy Engine Works, Quincy, Ill.; F. K. Copeland, Sullivan Machinery Co.; W. P. Eagan, of the F. W. Wolfe Co., Chicago; C. F. Wieland, of the Kempsmith Manufacturing Co., Milwaukee, Wis.; O. B. Kinnard, of the Kinnard-Haines Co., Minneapolis, Minn.; G. W. Watts, Canadian General Electric Co., Toronto, Ont.; F. C. Wheaton, of the Fensom Elevator Works, Toronto, Can.

The workings of the labor bureau were explained in de-

tail in a paper read by a Cincinnati manufacturer. He covered in general the labor situation in machine shops as created by the growth of unionism and referred to the necessity for better co-operation between employers and employes. One of the greatest obstacles to be overcome in this work, the speaker said, is the suspicion of the workers founded on the belief that it is to the employer's interest to grind them down and make slaves of them, and that such would be his course had he the power. It remains, therefore, for the employers to organize to overcome this. Of the functions of the labor bureau he said that, first, it must secure for the worker just what he most desires from the union, or, in other words, it must secure for him those results which both labor organizations and employers' associations agree in declaring are their basic objects—higher wages and shorter hours of labor.

Second, it must provide means by which the employes can reach employers, so that they can have their grievances heard without the necessity of joining a union to do so. Third, it must convince the working classes, or, rather, the public, that it can and will accomplish the purposes for which it claims to be organized. What is being done in Cincinnati was explained and the work of the employment bureau outlined in the following circular recently sent out by the Cincinnati Metal Trades Association:

The employment Bureau aims to establish the principle of fair dealing between employe and employer and to protect both in the exercise of their free rights as individuals, given by the Constitution of the United States.

The bureau will not stand for any unfair dealings on the part of either employers or employes.

The main purpose of the bureau is to make it easy for the employer to find men who want work, and for the men, when they want work, to find an employer. A plain, simple proposition making it possible for men out of work to learn at one place which employers are in need of men, and, by leaving their applications, make it possible for employers to learn at one place what men want work.

It saves time and it saves car fare. The employer gives first attention to the men sent from the office of the bureau.

In addition the bureau will—

1. Listen to any complaint of any workman regarding unjust or unfair conditions, and, if upon investigation, such complaint is well founded, will correct such condition without divulging the name of the employe making the complaint.

2. If a workman desires, for any reason, to move to another part of the country, it will not only direct him to where men are needed, but give him such a letter as will secure him employment.

3. The bureau will assist any man desiring to better his condition, and our Secretary will at any time furnish a list of employers desiring men of the applicant's particular class of ability.

It has listened to complaints of individual workmen, and corrected abuses which were unsuspected by the employers.

It has advised and induced many apprentices to complete their contracts.

All of this is to the advantage of the employe, and with your help, which the bureau earnestly desires, much more can be done.

One of the principal objects of the bureau is to show both employer and employe that their interests are identical and that the greatest good can be secured for both by their united efforts.

The bureau keeps no black list.

The plan as explained met with much favor from the visitors and the work of establishing employment bureaus similar to that at Cincinnati will be entered upon at once under the auspices of the officers of the National Metal Trades Association. These bureaus will be organized in New York, Boston, Philadelphia, Pittsburg, Rochester, N. Y.; Dayton, O.; Cleveland, Detroit, Indianapolis, Chicago, St. Louis, Minneapolis, Denver, Toronto and Milwaukee. When these various locals are once established a labor department of the National Metal Trades Association may be formed, but this is a matter to be determined as the movement develops.

MANY THOUSANDS IDLE IN NEW YORK.

It is estimated that there are nearly 200,000 men idle in the different boroughs of Greater New York as a result of strikes ordered by different unions and the lockout decided upon by material men and contractors in their fight against the unions. On Saturday the number of men out of work through these causes was upwards of 170,000 and to these were added Monday 10,000 men locked out by the material men of Brooklyn, and another 10,000 forced to lay down their tools for the want of material with which to work.

A few contractors have some material on hand, but none of them sufficient to last through the week. Work on most of the big buildings and in the sawmills and brickyards is practically at a standstill.

The men but for strikes, lockout and dissensions among rival labor unions, would be earning a total of $660,000 a day, or $3,960,000 a week. Not only is every penny of this stupendous sum lost but industries and firms representing a total capitalization of $550,000,000 are at a standstill, with a consequent loss of profits. The trade paralysis has reached a stage more extensive than any heretofore known.

AMALGAMATED ASSOCIATION MEMBERSHIP.

The membership of the Amalgamated Association of Iron, Steel and Tin Workers, as shown by the annual report at the Columbus convention, is 15,182. This includes quite a number of members recently enrolled in Central and Eastern Pennsylvania, which districts have for many years been outside the organization. Local conditions as to material worked are quite different, and the Western scale is not enforced even at the mills where the association now has quite a membership. While the annual report showed a membership of 15,182, the association pays dues to the American Federation of Labor on a basis of only 8,000 members.

The membership is the largest the organization has had since the Homestead strike, in 1892. For several years during the industrial depression the membership, even nominally, was not over two-thirds as great, while many nominal members were not in good standing. The cash balance in the treasury at the end of the last fiscal period is reported to have been $132,000, and if this is the case it is the largest the organization has had since 1891. Even the great strike of 1901 was entered upon with only $75,000 in the treasury.

TUBE WORKERS' WAGE SCALE.

(Special Telegram.)

PITTSBURG, May 27.—The executive committee of the International Association of Tube Workers meet today in St. Louis to take action on the report of the wage scale committee on iron and steel pipe and tube work. The Pittsburg convention on May 15 decided to refer this branch of the general scale back to the committee for revision. On brass and copper tube work a 20 percent advance was asked. The terms reported on iron and steel are not yet known.

THE TIN PLATE SCALE SIGNED.

The tin plate scale was signed in New York late Wednesday afternoon of last week, after a conference lasting from Tuesday of the previous week, between the conference committee of the Amalgamated Association and the American Tin Plate Co. It is the first time the tin plate scale was agreed to as a single conference of such extended duration, the conference being prolonged partly because the Amalgamated officials desired to close the matter, leaving time for the iron and sheet scales later, and partly because the tin plate company was anxious to have the matter off its hands, being booked far ahead and being solicited to take further business No orders had been taken for delivery beyond August 1, but orders on hand will require most of August to clean up, and the company has just announced itself as open for business to the end of September.

The wage rebate matter, in connection with the drawback and export trade, remains unaltered, the system being now in force for another year. No statement of the amount of business done under this system since its inauguration late last year is obtainable, but the amount is understood to be considerable, and is likely to increase whenever the pressure for crude steel diminishes.

The wage scale proper remains unaltered, and the principal change in the general scale is an increase in the limit of output, amounting to 500 pounds per turn on gauges 8 to 31, and 300 pounds on gauges 32 to 35, inclusive. There is practically no question that the increased tonnage can be made, which means an increased output, among the union mills, of 8.7

percent on 108- and 100-pound plates, and approximately this average on the whole scale. In 1899 an increase of 500 pounds per turn was given, in return for an increased wage rate per ton, and these two are the only increases made in the limit since the tin plate scale was first formulated.

Another important change in the scale was the elimination of the proviso that plates not treated in the works as black plates for tinning were to be paid for at certain advances over the scale. The application of this rule caused considerable trouble during the present scale year, since it led to a purely accidental discrimination between certain works where enameling sheets were made. At one works the sheets would receive the finishing treatment, while at another the sheets would be shipped out to receive the finishing treatment at another place; thus sheets intended for exactly the same purpose, and receiving the same ultimate treatment, would come under different wage rates, simply through the fortuitous location of the finishing plant. As the new scale stands there is no distinction as to subsequent treatment or use of the product.

The changes in the scale in detail are as follows:

In the table of wage rates the column for jaw shears is canceled.

Clause 5 now reads: "That all sheets or tin plates 14¼ square feet and over, when finished in six or more sheets to the pack, shall be paid for at the following rates above tin plate scale: ten percent extra on 26 gauge and heavier, and twenty percent for all lighter gauges up to and including 32 gauge, and for all sheets or tin plate 15½ square feet and over, finished in fours, the same percentage shall apply." Where the clause now reads 14¼ square feet the old clause read 14 square feet, and the following, in the old clause, is now absent: "and it is understood that when plates worked on a tin mill less than the above superficial square feet are not first pickled, annealed, cold rolled and thoroughly tested (sic) as plate for tinning purposes before leaving the mill where they are worked, the above percentage shall apply. This does not include shearman, as his wages for sheet work is based on jaw or crocodile work. All black plate orders to be marked on the bar when brought to the mill."

Clause 6: The words "and on jaw or crocodile shears the company to pay for opening the packs," are canceled.

Clause 16: The words in next to last line, "containing less than 14 square feet," are canceled, to avoid conflict with clause 5, and these words are added: "and when the percentages are paid under this clause those under clause 5 shall be inoperative."

Clause 21 is canceled: "That there shall not be any making up of lost weight on tin or black plate mills, on a turn where crews are obliged to follow out or give up the mill in less time than seven hours."

The following clauses are added:

24. When in the judgment of the manager the work is too heavy for the catcher, the company shall furnish extra help.

25. That the company furnish ice or well water to its employes.

The limit of output compares as follows, pounds per turn:

Gauges.	Old.	New.
8 to 11	13,500	14,000
12 to 13	12,500	13,000
14 to 15	11,500	12,000
16 to 17	10,500	11,000
18 to 20	9,500	10,000
21 to 24	7,500	8,000
25	6,750	7,250
26	6,350	6,850
27	6,150	6,650
28	5,650	6,150
29	5,750	6,250
30	5,550	6,050
31	5,350	5,850
32	5,150	5,450
33	5,150	5,450
34	4,950	5,250
35	4,950	5,250
36 and lighter	4,950	4,950

As the limit on 28 gauge, worked any style, is raised to 6,150 pounds, clause 1, "where 28 gauge is worked in six or eight sheets to the pack, 6,150 pounds shall be the limit," is canceled.

Clause 2 now reads as follows, the portions in parenthesis, in the old scale, having been eliminated: "On sizes 20½x56, an excess of ten (five) percent may be made, but on sizes less than 20 inches wide, the percent cannot be made, and on 26 wide and over an excess of fifteen (ten) percent on the limit may be made." (But if not made on that turn the percentage cannot be made up.)

Clauses 3 and 4 are canceled. These referred to making up, later in the week, turns which fell below the limit. With the increased general limit, each turn is to stand by itself.

LABOR NOTES.

The trouble which existed at the Phillips & Clark Stove Works, Geneva, N. Y., between the molders and their employers, has been amicably settled. The men had been on strike since April 23d.

Over 800 machinists of Baltimore have decided to make a demand for an increase of wages to ten percent, raising the minimum wage scale to $2.75 a day, the increase becoming effective July 1st.

The strike of the iron molders at St. Paul, Minn., will be settled by arbitration. The men ask for a nine hour day and a minimum wage of $3.00 a day. About 500 men have been on strike.

The agreement between the Boiler Makers' Union and the manufacturers in Cincinnati ends on the 8th of June, and it is stated that the workingmen will ask for an increase of twenty-five percent in wages.

About 170 members of the various sheet iron workers' unions, of Cincinnati, went out on a strike last week, demanding shorter hours and an increase in wages.

Rather than submit to unionizing of its plant, Smith & Wesson, revolver manufacturers, Springfield, Mass., have closed the plant. The firm recently consented to establishing a fifty-five hour week, but announces that it intends to run its own business.

The refusal of the puddlers of the Whitaker Iron Co., Wheeling, W. Va., to work as the superintendent ordered has resulted in a shut-down for an indefinite period. The cause of the complaint seemed to be that the management of the mill desired the puddlers to work one heat of castings and four of pig iron per turn, and this the men refused to do.

The Iron Molders' Union is now taking a referendum vote on a proposition to rescind a resolution passed last July during a convention of the union in Toronto prohibiting any of the National officers from becoming members of the National Civic Federation. The returns are being counted and so far indicate that the voting will favor rescinding the Toronto resolution.

The demand made by the machinists of Ithaca, N. Y., for a nine-hour day at a ten-hour wage has been granted by all the employers except the Williams Bros.

Rather than allow the union to run its business, the Continental Iron Works, which occupies two city blocks in Williamsburg, Brooklyn, N. Y., has been shut down, and 350 employes are locked out. The company had agreed to give an increase of fifteen percent in wages and a nine-hour day, and this appeared to be satisfactory to the men, and it was supposed that all would be well, until a walking delegate appeared and told the employes that any concessions they might get would be useless unless the union was officially recognized. The management says that under no circumstances will the union be recognized.

President James McMahon of the Blast Furnace Workers and Smelters' Union, has gone on a trip to Chicago and other cities in the West to organize blast furnace workers in the unions.

A strike of laborers at the furnace of Corrigan, McKinney & Co., at Charlotte, N. Y., last week was soon settled without concessions being made. Some of the men returned to work and new men took the places of some of the strikers.

The condition of affairs at the Hecla Iron Works, Williamsburg, Brooklyn, is extremely unfortunate. The lockout was caused by a small number of the employes precipitating trouble because they thought they should have more pay and a Saturday half holiday. These men are very unpopular with the majority of the employes, who are made to suffer because of the action of a few. There seems to be no prospect of a settlement of the controversy.

AMERICAN FOUNDRYMEN'S ASSOCIATION.

The Secretary, Dr. Richard Moldenke, issues from New York City a provisional program for the convention to be held in Milwaukee June 9-11. The opening session will be called to order promptly at 10 a. m. on Tuesday, the secretary says, and an effort will be made to save the half-hour or more that is usually lost in getting to work. The order, subject to change, is as follows:

TUESDAY, JUNE 9, 10 A. M.

Addresses of welcome and responses
Address of President.
Report of Secretary.
Report of Treasurer.
Report of Auditing Committee.
Report of Committee on the Standardizing Bureau.
Report of Committee on standard methods of determining the constituents of cast iron.
Report of Committee on sampling cast iron.
Report of Committee on the proper valuation of pig iron for Foundry Purposes.
Report of Committee on Insuring Patterns.
Report of Committee on the Foundry Trade School.

TUESDAY AFTERNOON, 2 O'CLOCK.

An address by Mr. Jos. Leon Gobeille, president of the Gobeille Pattern Co., Cleveland, on "The Organization, Maintenance, and Management of a Modern Pattern Shop." Sketches, drawings and photographs will be shown, and Mr. Gobeille has consented to answer questions.

The session will then organize into the Foremen's Section of the Association, and the following papers are scheduled:

"A simple Device for Ascertaining the Average Silicon in an Iron Mixture," by A. W. Walker, Boston, Mass.
"Foundry Control," by R. P. Cunningham, Holyoke, Mass.
"Foundry Management," by David Spence, Chicago, Ill.
"Permanent Molds," by Jas. A. Murphy, Erie, Pa.
"Note on Continuous Molding," by Edward Richelieu, South Tacoma, Wash.
"Molding Machines," by Edward Gilmour, Peoria, Ill.

In addition to the discussions on the above matters, it has been requested that the question of the disposal of waste coke, which is an item in large establishments, be taken up.

TUESDAY EVENING, 8 O'CLOCK.

"Retort Oven Coke for Foundry Use," by Wm. J. Keep, Detroit, Mich.
"Note on Estimating Methods," by Wm. Hanson, Philadelphia, Pa.
"The Molding Machine" (continued), by S. H. Stupakoff, Pittsburg, Pa.
"Malleable Cast Iron," by Dr. Richard Moldenke, New York.
"Employer and Employe," by S. H. Stupakoff, Pittsburg, Pa.

An address by Mr. S. S. Knight, Manager Birmingham Pipe & Casting Co., Birmingham, Ala., on "The Principal Factors of the Iron Industry in the Birmingham District." This will be illustrated with lantern slides specially prepared for the lecture.

WEDNESDAY, JUNE 10, 10 A. M.

The session will be devoted to the proceedings of the Metallurgical Section of the Association, all members of the association, however, being asked to participate.

"The Metallurgical Engineer in the Foundry," by Henry Souther, Hartford, Conn.
"Loss of Sulphur in Borings of Cast Iron," by W. E. Dickson, Sharpsville, Pa.
"Notes on the Microstructure of Cast Iron," by Percy Longmuir, Sheffield, Eng.
"Blast Furnace Conditions affecting the Chemical Condition of Foundry Iron," by W. Walley Davis, Roanoke, Va.
"Buying Pig Iron on Specification," by Herbert E. Field, Ansonia, Conn.

Discussion on "Methods for Determining the Constituents of Cast Iron," as already compiled by the secretary of the Metallurgical Section, H. E. Field.

Discussion on "Recovery of Nickel from Scrap Anodes Used in the Nickel Plating Process,"—this by request made at the Boston convention.

WEDNESDAY AFTERNOON, 1 O'CLOCK.

Trolley ride to West Allis, visiting the new plants of the Allis-Chalmers Co. Returning by way of the Soldiers' Home, with band concert, etc., and arriving at Hotel Pfister at about 6 p. m.

WEDNESDAY EVENING.

Theater party.

THURSDAY, JUNE 11, 10 A. M.

Unfinished Business.
New Business.
Election of Officers.
Adjournment.

THURSDAY AFTERNOON, 2 O'CLOCK.

Trolley ride to the parks, breweries, and other points of interest, returning to Hotel Pfister at about 6 p. m.

THURSDAY EVENING.

A smoker at Hotel Pfister. Music by the Lyric Glee Club. Addresses by prominent speakers, and the "stuff that made Milwaukee famous."

In addition to the above program, the executive committee of the Milwaukee foundrymen announce that a special reception committee of the Milwaukee ladies has been formed to care for our ladies, and they will arrange drives around the city, visiting the Art Gallery, public library, and other points of interest.

The secretary has arranged for a railroad rate of one fare and a half by the use of the certificate plan.

The New England Delegation.

It is probable that a party of from 20 to 30 New England foundrymen will go by special car to the Milwaukee convention of the American Foundrymen's Association June 9-11. Details of the trip have already been sent to foundrymen in the New England States, and the New York party is expected to connect with the New England delegates' train at Albany. The train leaves Boston at 2 p. m. on Sunday, June 7, and arrives in Chicago on Monday at 3:15 p. m. Leaving Chicago at 5 p. m. the party will arrive in Milwaukee at 7:10 p. m. The New England party is expected to be the largest that has ever gone out of that section to a foundrymen's convention.

The Hanging Rock Region.

IRONTON, O., May 25.—William Rogers and Judge Lot Davies, two of the pioneer furnacemen of this region, died last week, the former here and the latter in Jackson county.

The Norfolk & Western Railroad Co. will erect a large planing mill at its Portsmouth terminals, and will likely be in the market for equipment.

The Ironton Foundry Co. has completed plans for a new pattern shop and warehouse to replace those destroyed by fire some weeks ago.

The steel furnaces at the Portsmouth Steel Co. plant are closed down temporarily, while the new steel charger is being put in place.

Raymond D. York, of Portsmouth, has been granted a patent on a process for rolling blanks for beams.

The Foster Stove Co. has accepted plans for the entire reconstruction of its plant in this city. The buildings will be three stories and have a total frontage of 576 feet on three streets. Portland cement will probably be the building material.

J. P. McCaslin has resigned as superintendent of the Eagle plant of the Republic Iron & Steel Co., and takes a similar position with the Ohio Steel & Iron Specialty Co., of Cuyahoga Falls, O. Secretary H. H. Mittendorf is now in charge of the plant, which has been idle for weeks.

W. L. Simonton, manager of rolling mills for the Republic, was here last week and went over the Eagle plant with N. & W. officials. Local papers see in the conference another prop to the theory that the mill is to be abandoned.

W. E. Reynolds, of Chattanooga, and C. H. Humes, of Ironton, have secured the greater part of $30,000 in stock subscriptions asked for the location of a disc plow factory here. The capital will be $100,000.

NATIONAL ASSOCIATION OF MANUFACTURERS.

A meeting of the executive committee of the National Association of Manufacturers was held in New York city May 22. Only two of the fifteen members of the committee were absent. Those present were: George T. Coppins, of the Walworth Manufacturing Co., Boston; A. H. Bullard, of the Bullard Machine & Tool Co., Bridgport, Conn.; William McCarroll, of the American Leather Co., New York; E. F. Hartshorn, of the Stewart-Hartshorn Co., Newark, New Jersey; A. B. Farquhar, of the A. B. Farquhar Co., York, Pa.; J. A. Jeffery, of the Jeffery Manufacturing Co., Columbus, Ohio; James Inglis, of the American Blower Co., Detroit; H. S. Smith, of the Menasha Wooden Ware Co., Menasha, Wis.; C. N. Fay, Fay-Sholer Co., Chicago; J. W. Van Cleave, of the Buck's Stove & Range Co., St. Louis; H. S. Chamberlain, of the Cittoco Furnace Co., Chattanooga, Tenn.; David N. Parry, of the Parry Manufacturing Co., Indianapolis; Marshall Cushing, secretary, New York. The two absent members were F. H. Stillman, of the Watson-Stillman Co., New York, and Charles A. Carlisle.

Committees were appointed as follows to carry out important measures of the association:

Executive committee at large—George A. Draper, of the Draper Machine Co., Hopedale, Mass.; Charles A. Sheron, of the Charles A. Sheron Co., New York; Daniel C. Ripley, United States Glass Co., Pittsburg, Pa.; Thomas P. Egan, J. A. Fay & Egan Co., Cincinnati; F. C. Nunemacher, Louisville; Daniel A. Thompkins, of the Daniel A. Thompkins Co., Charlotte, N. C.

The legislative committee, which will look after legislation of particular interest to the association—A. D. Bellany, Florence Wagon Co., Florence, Ala.; H. T. Scott, Union Iron Works, Cal.; Samuel M. Jarvis, of the P. & F. Corbin Co., New Britain, Conn.; H. W. Gause, Harlan & Hollingsworth, Delaware; Daniel Fraser, the Norris Peters Co., District of Columbia; Major J. F. Hanson, Bibb Manufacturing Co., Macon, Ga.; James Deering, of the International Harvester Co., Chicago; J. S. Ketcham, Brown-Ketcham Co., Indianapolis; James W. Porch, of the Lukins Iron & Steel Co., New Orleans; C. W. Post, of the Postum Cereal Co., Battle Creek, Mich.; W. S. Dickey, of the W. S. Dickey Clay Manufacturing Co., Missouri; Benjamin H. Tatem, the Bald-Butte Mining Co. Helena, Mont.; E. B. Pike, of the Pike Manufacturing Co., Pike Station, N. H.; R. C. Jenkinson, of R. C. Jenkinson & Co., New Jersey; Otis H. Cuttler, of the American Brake Shoe & Foundry Co., New York; Ludwig Nissen, of Ludwig Nissen & Co., New York; Colonel Joseph Kilbourne, Pennsylvania; Thomas Dolan, of the United Gas & Improvement Co., Philadelphia; Theodore C. Search, Philadelphia; Henry P. Sharpe, of the Brown & Sharpe Mfg. Co., Rhode Island; James Menard, of the Brookside Mills, Knoxville, Tenn.; E. T. Bull, of the J. I. Case Threshing Machine Co., Wisconsin.

The following vice presidents were elected by the executive committee: California, Fred J. Koster, San Francisco; Delaware, Charles W. Pusey, Wilmington; District of Columbia, Daniel Fraser, Washington; Iowa, F. S. Kretsinger, of the Iowa Farming Tool Co.; Kansas, H. N. Strait, of Kansas City; Maryland, Summerfield Baldwin, of the Baldwin-Warren Mfg. Co.; Minnesota, H. S. Kinney, Winona; Mississippi, F. P. Fox, Vicksburg; Montana, Benjamin Tatem, Butte; Virginia, Clifford Lewis, Richmond.

The president was authorized by the executive committee to select additional legal counsel for the association with instructions that a general plan be prepared whereby the members may defend themselves against unlawful acts of unions. While not specifically mentioned, the acts to which attention will be given in drawing up the plan of defense will be injunctions, boycotts and the interference with employes.

At the New Orleans convention a special committee of seven was appointed, to which the president and secretary of the association were added, for the purpose of extending the organization. This special committee met May 22, and passed a resolution empowering the secretary to communicate with the employers of any trade which shall, by the request of any five members, of the association engaged in any one trade, ask that such trade be specially organized into an association, and the secretary was also authorized to render any reasonable assistance in perfecting organization.

Alan Wood Iron & Steel Co.

The Alan Wood Iron & Steel Co., Conshohocken, Pa., has nearly finished its new steel plant, expecting to start the first furnace in a couple of weeks. There are five basic open-hearth furnaces of 50 tons capacity. The blooming mill is nearly completed. There will also be a universal plate mill, which will, in addition to plates, roll material for the sheet mills of the Alan Wood Co. This will not be ordinary sheet bar, but will be rolled the width of the sheet desired, and sheared into short lengths, so that the direction of rolling will not be changed as in the more common practice, where the sheet mill rolls crosswise of the sheet bar mill.

The will of Benjamin F. Jones has been filed for probate at Pittsburg. Estimates of the value of the estate are from $30,000,000 to $35,000,000. Mr. Jones held 51 percent of the Jones & Laughlin Steel Co. His real estate holdings are estimated at $1,000,000 and his stock in the Pittsburg Trust Co. at $1,200,000. There was also other property. The will was dated Jan. 14, 1903, and Major George M. Laughlin, Willis L. King, vice president of the Jones & Laughlin Steel Co., and B. F. Jones, Jr., only son and president of the company, were made executors and trustees. Certain income is set aside for the widow and annuities are provided for certain relatives. The entire residue is divided into five equal parts—one-fifth to the widow, one-fifth to B. F. Jones, Jr., and three-fifths to be administered by the trustees on behalf of the three daughters, the principal ultimately to go to their children. At the annual meeting this week of the Angeline Dock Co., a subsidiary interest of the Jones & Laughlin Steel Co., B. F. Jones was elected president, succeeding James B. Laughlin. W. C. Moreland was made a director, succeeding the late B. F. Jones. The Pittsburg Trust Co. and the People's National Bank have both elected B. F. Jones a director to succeed his father.

The conference on the iron scale between the manufacturers and the committee of the Amalgamated Association began on Tuesday of this week at Detroit. The conference on the sheet scale will begin in Pittsburg next Wednesday, June 3.

The foundation is now being laid for the plant of the Ford City Foundry & Machine Co., Ford City, Pa. Contract is let for buildings, engines, boilers, electric equipment, cranes and portion of foundry equipment. Machine tools will be bought the 1st of June.

The purchasers of the plant of the Etna Furnace Co., Etna, Ga., are forming a new iron and mining company and will soon be in the market for equipment. Later the company will decide as to the advisability of erecting a large coke furnace. Alex. T. Hamilton, Etna, Ga., is the agent of the company.

The Falls Rivet & Machinery Co., of Cuyahoga Falls, O., will be reorganized. The Cuyahoga Falls plant will be operated as the Falls Rivet & Machine Co.; capital, $300,000. The New York and Boston branches will be reorganized under the same name, with capital of $125,000. Edwin Seedhouse, of Maine, will be president.

Work has begun on the two blast furnaces to be erected at Lorain, O., in view of the building of new works of the National Tube Co. there. For the skelp and tube plant a number of contracts have been let, but ground has not yet been broken. Mackintosh, Hemphill & Co., of Pittsburg, have the contract for the new plate mill in the skelp department.

The Southern Foundry & Machine Works, Fredericksburg, Va., have been sold to Leffler Franklin, of Chicago, who will improve and enlarge the plant.

The Continuous Open-Hearth Process.*

BY BENJAMIN TALBOT.

In May, 1900, it may be remembered that a paper was read by the author before this institute, describing what is now known as the continuous process of steel-making, in which were given the results that had been obtained up to that date in the furnace working this process at Pencoyd, Pa.

Since that date considerable progress has been made, and some results have been obtained which he ventures to think may be of interest to the Institute. At that time the furnace at Pencoyd, which has held as much as 75 tons of metal, was considered large, but we have already progressed, and this is now spoken of as a small furnace. In the discussion on that paper, Mr. E. P. Martin stated that, in his opinion, furnaces in the future worked on this continuous system would be about 200 tons capacity, and this prophecy has already been fulfilled, a furnace of this size (200 tons) having been in operation for some few months at the works of Jones & Laughlins, at Pittsburg, Pa. In addition to this, furnaces of very nearly this capacity are being erected both in this country and in France, and a number of 200-ton furnaces will shortly be erected in the States.

The author has quite recently had the opportunity of investigating the working of the 200-ton furnace at Pittsburg, and also of revisiting Pencoyd and of learning what has been done there, since the date of his former paper, in the furnace already referred to. At Pencoyd the furnace is still working with identically the same hearth with which it started the process, now some three and a half years ago. The furnace is holding on an average from 60 to 65 tons, and the average weekly output is 650 tons, from liquid cupola metal, containing about 0.8 percent phosphorus. The yields which were established by the figures given in the previous paper—viz., a gain of from 5 to 7 percent on the total metal charged in—have been fully maintained.

The author would emphasize the fact that this furnace, although it has been spoken of as a 75-ton furnace, has in reality a surface area of only 9 feet by 30 feet at the bath or fore-plate level, and consequently is about the size of so-called 30-ton fixed furnaces. The bath, however, is somewhat deeper than that which would be worked in a fixed furnace.

The 200-ton furnace at Jones & Laughlins' has been in operation since last summer, and, although they have had some minor troubles with details in the design of the furnace, which in a furnace differing so radically from existing furnaces as regards size, is not perhaps to be wondered at; yet, when the author was there in the month of February last, they had surmounted these small preliminary troubles, and were running very satisfactorily. The work with this furnace is more than ordinarily interesting, because their liquid blast-furnace metal is of hematite quality, containing some 0.1 percent phosphorus, which is the standard Bessemer metal of Pittsburg. In fact, the same storage vessel which supplies the Bessemer converters supplies the 200-ton open-hearth furnace. The lining of the furnace is composed of magnesite bricks, with calcined magnesite fused on. In the author's opinion a good quality of shrunk dolomite for fusing on is perfectly satisfactory. The furnace is supplied with natural gas, which is one of the advantages of the Pittsburg district. It is arranged to tilt so that the center of rotation is coincident with the port which supplies the gas in every position. The furnace is oval in shape, being 17 feet 6 inches wide in center, with curved sides diminishing to 14 feet 6 inches at the ends, and is 40 feet long between ports. This gives a surface area at the fore-plate level of about 640 square feet. The furnace tilts both ways, so that slag can be taken from the slag-spouts in the fore-plates on the charging side of the furnace whenever desired, and this is done very satisfactorily. The design of the tilting arrangement is elaborate, but it forms a fine piece of engineering work. The ports now used on this furnace are much the same as those used at Pencoyd and at Frodingham, and consist of one gas-port in the center, with an air-port at a slightly higher elevation on each side of it.

The author was at Pittsburg in February, and watched the working of this furnace throughout the week ending 21st February. The results obtained during this week are summed up in Table A, and the details of two charges are fully set out in Tables B and C. It should be stated that the week was a stormy one, the weather being very severe, which militated against getting the best output from the furnace, many of the charges being delayed by the severity of the weather.

The liquid pig metal used was the standard Bessemer used in the States, and came from the receiver which supplies the Bessemer direct. The average composition may be taken as: Total carbon, 4.0 percent; silicon, 1 to 1.25 percent; phosphorus, 0.1 per cent; manganese, 0.65 percent; sulphur, 0.06 percent. It will be noted that the furnace was partly charged on Saturday night by putting in cold scrap and cold pig iron, which was continued until some 150 tons had been charged in by about 7 a. m. on Sunday morning. Between 3:30 and 4:30 on Sunday afternoon some 30 tons of liquid metal were poured in, and the first heat was taken out of the furnace by 5:55 p. m. on Sunday evening. It is the usual practice in the Pittsburg district to get heats ready in the steel furnaces and in the Bessemer departments, so that the rolling mills can start up and begin to roll on Sunday evening. Apart from this, if liquid steel is not retained in the furnaces during the week end, it would seem that the proper way to work such large furnaces is by charging in cold material on Saturday night, so that it could be quietly melted down during Sunday, the only skilled attention required being from the furnaceman to look after the gas in the furnace.

The various operations during the week can be best followed from the table. Heats of from 40 to 50 tons were taken out about every four and a half hours, the carbon in the steel cast running from 0.15 to about 0.40 percent. It will be seen that the iron ore and dried scale used averages about 13.5 percent on the liquid metal charged, and this will no doubt be increased as they shorten the time in working the heats. The ferro-manganese used works out to 10.2 pounds per ton of steel. As will be seen the total make of steel during the week was 1,415 tons, consisting of 1,385 tons of ingots and 30 tons of scrap, the scrap including butts of all description, and scrap due to a defective stopper on heat 12,679. In this heat the advantage of casting by means of an overhead traveling crane was clearly shown, for when it became evident that the stopper in the first ladle could not be used, the whole contents of this first steel ladle were at once teemed into a second ladle by the auxiliary on the overhead crane, and the second ladle then picked up by the crane and the casting continued in the ordinary way. In ordinary English practice with the ladle on the usual carriage and no overhead system, the whole of the charge would have had to be poured out over the lip, which is well known to be unsatisfactory. The yield of steel and scrap on the total metals charged works out to 100.7 percent. Owing to the extremely wet state of the scale which was chiefly used, the oxides added during this week were purposely limited, so that the yield is not so high as it would otherwise be. To show how near the carbons absolutely obtained in the steel agree with those specified as wanted in the rolling mill department, a column has been inserted in the table showing the various carbons desired in the case of each cast.

A few of these charges have been mechanically tested with the following results:

Test cut from	Melting No.	Elastic Limit.	Ultimate Strength.	Elongation in 8 In.	Reduction of Area.	Analysis.			
						Carb.	Phos.	Mang.	Sul.
	Lbs. per Sq. In.	Lbs. per Sq. In.	Per Cent.	Per Cent.					
6″×6″×$\frac{7}{16}$″	12,672	32,000	58,500	27.75	57.0	0.16	0.028	0.56	0.047
6″×6″×$\frac{5}{16}$″	12,673	34,340	59,820	28.5	44 3	0.17	0.030	0.44	0.046
6″×6″×$\frac{7}{16}$″	12,675	35,530	57,050	30.0	53.0	0.16	0.037	0.46	0.048
6″×6″×$\frac{5}{16}$″	12,676	36,800	59,100	29 0	47.8	0.19	0.024	0.40	0.049
6″×6″×$\frac{7}{16}$″	12,679	33,200	57,430	29.0	48.9	0.16	0.027	0.56	0.062

The steel made in this furnace has ranged from 0.50 percent carbon down to dead soft material, and has been rolled into

*Read before the Iron and Steel Institute, London, Eng., May, 1903.

angles, channels, beams, and all structural materials, and has also been worked up into axles and plates, with perfectly satisfactory results.

The full details of two of the charges made in this week are given in Tables B and C. From these it will be noted that the carbon in the liquid metal additions was rapidly eliminated during the reaction, and that the slag at the end of the heat was very low in iron oxide. In a few instances the slag was poured off on the charging side, as soon as the bath had quieted down, after the reaction following the introduction of the liquid pig iron. Charge 12,677 shows that the carbon calculated as present in the bath, after the addition of the first ladle of molten iron, was reduced in seven minutes to 0.44 percent from the theoretical 0.55 percent. On the other hand Charge 12,697 shows the calculated carbon to have been reduced from 0.46 percent to 0.15 percent in twenty-seven minutes, proving that the reactions can be diminished or increased at will, and in cases where higher carbon steels are desired, as for rails and axles, such a metal can be easily obtained without first taking out the whole of the carbon and then recarburising back to the desired extent.

Although during the week the author was at Pittsburg the furnace was using all pig iron, except the scrap used in the filling heat, yet they have also worked most successfully there for a considerable period with a high percentage of scrap in the charge. The following synopsis of two weeks' work gives typical examples of this method of working, the percentage of scrap used being respectively 62 and 65 percent of the charge. This large proportion of scrap in the charge did not lead to an increased output for the week, which in work with the ordinary fixed furnace using solid material would, as is well known, have been the case.

As will be seen, the yield obtained when using this high percentage of scrap in the charge is very good, but, of course, not equal to that which can be obtained when using all pig metal in the charge. To those, however, who are forced to use large quantities of light scrap in the charge, such as sheet mills, etc., there is a great advantage in being able at once to plunge this light scrap into a large bath of steel, covered with a layer of slag, which prevents oxidation. As is well known when scrap is melted down slowly on the hearth itself, a great waste through oxidation occurs.

	Week ending September 27, 1902.			Week ending October 4, 1902		
	Tons.		P.Cent.	Tons.		P.Cent
Hot Metal	497	=	36.9	472	=	34.6
Miscellaneous Scrap	803	=	62.7	863	=	65.0
Swarth	40			25		
Ferro-manganese	5	=	0.4	6	=	0.4
	1345	=	100.0	1366	=	100.0
Cliff shaft ore	20	=	0.8	13	=	1.0
Limestone	71	=	5.4	69	=	5.1
Burnt lime						
Ingots	1344	=	99.7	1353	=	99.0
Butts and scrap	11	=	0.8	1	=	0.1
Gain		=	0.5	Loss	=	0.9
Number of heats	28			28		
Average weight of heat	48 tons.			48.3 tons.		
Average time of heat	5 hrs. 45 mins.			5 hrs. 36 mins		

In reference to sulphur in the continuous process, it will be noticed that, as in the ordinary basic open-hearth process, there is no appreciable elimination of this element. The author considers that a large elimination of sulphur in the basic open-hearth furnace is a very expensive operation, and has always been of opinion that the blast-furnace and mixer are the proper places in which to eliminate sulphur, so that when the liquid metal arrives at the steel furnace there is no necessity to make an extra basic slag containing 50 percent and over of lime, and using with it fluor spar or calcium chloride. If, however, high sulphur material is used in the steel furnace, a highly basic slag can be made, but the output will be decreased, as is the case in the ordinary fixed furnaces, which, of course, adds considerably to the cost of making the steel. Again, if the metal treated is phosphoric, and the slag is sufficiently rich to be of value as a fertilizer, the question of the influence of fluor spar and calcium chloride in rendering a portion of the phosphoric acid insoluble in citrate of ammonia must be considered, as it reduces the commercial value of the slag.

oxides at 70 percent this would give some 87.5 tons iron added as oxide, of which only some 11.5 tons were subse-

Although in England no furnaces are being erected of quite so large a size as the Pittsburg furnace just described, we are in this instance not much behind. At Cardiff, at the works of Messrs. Guest, Keen & Nettlefolds, Ltd., a large furnace, rated at 160 tons, has just been completed, and most interesting results may be expected from it, as the pig iron employed there will be hematite. The Weardale Steel Co. is erecting at Cargo Fleet, near Middlesborough, a large plant to work the continuous process in connection with its new steel works, in which it is ultimately intended to have four large furnaces, rated at 175 tons. At present only two of these are being erected. In France, at the Senelle-Mabeuge Co.'s Works at Longway, arrangements have been made for the erection of two furnaces of the same size as those at Cargo Fleet.

The first plant on this system erected in this country by the Frodingham Iron & Steel Co. at Frodingham, has now been in operation since January, 1902, and the fact that this company is now removing other fixed furnaces to make room for continuous furnaces is the best evidence that the author can offer as to the success of the process at these works. The furnace at Frodingham is one of 100 tons capacity; it worked during the whole of last year on molten pig iron, and during this period no repairs to the hearth were necessary, but the furnace stopped twice during the year for the necessary repairs to the side walls and ports; at the end of the year another stoppage for repairs was required, so that it may be said that the average campaign of such a furnace may be taken at from three to four months with phosphoric pig iron.

The average composition of the molten pig iron employed at Frodingham is: Silicon, 0.75 to 1.25 percent; phosphorus, 1.75 to 2.0 percent; manganese, 2 percent; sulphur, 0.06 percent. The average weekly make of the furnace is now from 600 to 650 tons. This pig metal undoubtedly takes somewhat longer to work, owing to the high percentage of metalloids, than does such metal as that used at Pencoyd or at Pittsburg. The yield, however, is very good, and the slag is higher in phosphoric acid than that obtained from heats working the same metal in fixed furnaces. It is found at Frodingham that the slag from the continuous process is some three or four percent higher in phosphoric acid than that from their ordinary furnaces.

The author submits that the results so far obtained at the Frodingham works are thoroughly satisfactory in every respect, especially when it is considered that all the molten pig iron is used direct from the blast-furnaces, and that therefore pig iron of somewhat varying composition has had to be taken. It has now been decided to erect a mixer at Frodingham, for use in conjunction with the continuous process, and this will enable a more regular supply of pig iron to be obtained, which in the author's opinion will lead to a considerable increase in the output from the continuous furnace. Two weeks' work from this 100-ton furnace are annexed, one taken early last year, soon after the process started, and the other taken in October, when more experience had been obtained.

During the week ending the 8th March, 1902, the following results were obtained from pig iron containing about 1.7 percent phosphorus:

Metals Used.	Tons.	Cwt.	Per Ton of Ingots Cwt.
Scrap	50	0	1.74
Hot Metal	474	16	16.60
Cold metal	23	6	0.81
Ferro-manganese	3	3	0.11
	551	5	19.26
Ingots made	572	3	2 equals 103.81
Ingots and scrap made	584	0	2 " 106.0

To produce this amount of steel they used :—

	Tons.	Cwt.	Per Ton of Ingots Cwt.
Iron oxides	125	12	4.41
Burnt lime	43	4	1.51

To produce this amount of steel they used:

The slag obtained weighed 121 tons, with an average composition of 9.4 percent iron, and 16.53 percent phosphoric acid.

It will be seen both from the yield obtained, and from the analysis of the slag, that the reduction of iron from the oxide added must be very complete. Taking the average iron in the quently found in the slag, thus showing that some 76 tons were directly reduced from the oxides during the week. This con-

firms the yield, as say 500 tons were added as crude metal (pig) with 92 percent real iron and 50 tons as scrap at 99 percent real iron, which gives a total of 509.5 tons real iron added in the bath. The 76 tons directly reduced as above, brings the calculated total weight to 585.5 tons, against 584 tons obtained by direct weighing.

WEEK IN OCTOBER 1902.

Charged.				Cwts. per Ton of Ingots.
	Tons	Cwt.	Qrs.	
Scrap	50	0	0	1.62
Hot metal	502	0	0	16.29
Cold metal	39	18	0	1.29
Ferro-manganese	3	11	0	0.11
	593	9	0	19.51
Ingots produced	616	15	0	103.52 per cent.
Scrap	7	16	0	1.35 "
Total ingots and scrap	624	11	0	104.87 "
	Tons	Cwts.	Qrs.	Cwts. per Ton of Ingots.
Scale	134	19	2	4.38
Pottery mine	18	0	0	0.58
Gellivare ore	0	16	0	0.02
	153	15	2	4.98
Burnt lime	44	8	0	1.38
Slag made	130	8	0	215

When considering the problem of working liquid blast-furnace metal, especially liquid hematite metal, in the open-hearth furnace, one is forced to the conclusion that that process which will most rapidly eliminate the carbon is the one which will come into use. In fact, one may say that the solution of the problem of working liquid hematite metal in the open-hearth nearly as rapidly as in the Bessemer converter must depend upon the speed at which the carbon can be removed from the molten metal by means of iron oxides, at the same time maintaining a temperature which permits of such rapid removal without freezing the metal. In the processes which have been proposed for employing in the basic open-hearth furnace large quantities of oxides in conjunction with the use of molten pig iron, various disadvantages have presented themselves, which are fairly well known to those who have operated in this direction. When oxides are preheated on the hearth itself to such an extent as to melt them to a slag, there is, quite apart from the time which this necessitates, the well-known detrimental action which such scorification has upon the material composing the hearth. If, on the other hand, the oxide and lime added on the hearth be only partially melted, some of the mass will more or less adhere to the furnace bottom, and a rapid filling up of the furnace will take place, so that its capacity is corespondingly reduced. It is also known that when liquid blast-furnace metal is poured on to preheated oxides and lime, in a basic open-hearth furnace, the average time required to bring the carbon down to about 1 percent is about six or seven hours (in the case of 40-ton charges), calculated from the time of charging the oxides. At the usual temperature of blast-furnace metal when poured into such a preheated furnace, containing only oxides and lime, the slag formed rises into a foamy mass, and this frothy condition continues for hours. Whilst the slag is in this condition, the removal of the carbon is slow, owing to the insulating action of the thick layer of slag upon the surface of the bath. For the rapid elimination of the carbon heat must be imparted to the metal whilst the slag is in this foaming condition, and if to impart this necessary heat the layer of slag be poured off, a great waste of iron oxide results, as this slag contains from 35 to 45 percent of ferrous oxide. Again, this slag has to be re-made, although it is then made slowly, by charging in small solid additions, which allows the metal to pick up its heat whilst the formation of the necessary slag is going on. This is continued until the carbon is boiled down to the desired point.

In the continuous process, when making 40-ton heats in the 200-ton furnace by dilution alone, when the metal is brought up in two lots of 20 tons each, and boiled down between each addition, the carbon in the bath is never much above ½ percent. This ½ percent is rapidly burnt out by means of the oxygen in the slag, which slag, as a rule, is not any richer than that which in the ordinary pig and ore process has to be run off. In the large bath of steel existing in the furnace we have a reservoir of heat, containing heat in excess of that required to maintain the bath of metal in a molten condition and to enable it to be cast into ingots without skulling. This excess of heat serves as a buffer in regulating the temperature in the furnace, which is lowered by the introduction of the molten pig iron, and to some extent by the dissociation of the iron oxides introduced.

The higher temperature which this state of things brings about in the furnace develops an entirely different reaction, as is evidenced by the surface of the bath. Instead of the frothy, seething condition, lasting unchanged for hours, a vigorous boiling reaction takes place, which settles down to a quiet condition within some fifteen to thirty minutes. The bringing about of this "boiling" reaction, as distinct from the "seething" reaction, is essential to the quick reduction of the carbon, and the conditions necessary to insure a successful reaction are a sufficiently high temperature in the furnace, a slag containing excess of oxide, but at the same time not too great an excess, and by preference a bath low in carbon, which is found to be a condition most desirable for rapid carbon elimination.

As will be seen from the tables, so soon as the heat is cast from the furnace, and the furnace has been turned back, oxides, and lime when necessary, are charged into the slag existing in the furnace. The slag at this time, being low in oxide, rapidly absorbs that introduced, and by the time the men have finished fettling round the slag line, it will be found that the slag is in a suitable state for the immediate addition of more pig metal. Therefore it is not necessary to delay the furnace solely for the purpose of heating up the requisite oxide and lime additions, as is the case when these are thrown directly into an empty furnace. The reaction is entirely under control when properly supervised. It may be necessary to vary the speed at which the pig iron is run in, and also to add lime to thicken the slag if this should be too thin, but the workmen soon learn to recognize these conditions.

At the temperature employed the carbon rapidly combines with the oxygen of the oxides in the slag, resulting in the evolution of great volumes of carbonic oxide, additional oxygen being supplied by the heated air from the regenerator by which the carbonic oxide is rapidly burnt to carbonic acid over the bath in the furnace itself, and also in the regenerators on the outgoing side of the furnace. As this undoubtedly occurs the heat evolved must certainly help to raise the temperature of the bath. Through bringing this into prominence the author has been criticised by Mr. H. H. Campbell, of Steelton, in his recently published work on the manufacture and properties of iron and steel. In this most valuable book Mr. Campbell has devoted considerable attention to the continuous process, and although the author does not agree with his deductions, he recognizes the open mind which Mr. Campbell has brought to bear on the matter.

Mr. Campbell objects to give the continuous process any credit for the heat evolved by the rapid combustion of the large volumes of carbonic oxide gas evolved during the reaction of the oxides upon the carbon of the molten metal run in. This seems to the author somewhat unfair, as in the case of the Tropenas process he states that the carbonic oxide evolved in the bath is burnt over the surface of the bath by a set of tuyeres, thereby creating much heat and rendering the steel itself much hotter. If he allows this to be possible in the one case, it seems contradictory not to allow it in the other, especially as, in the case of the open-hearth furnace, the heat can be most completely utilized by being absorbed in the regenerators, which is not possible in the case of the converter.

Some amount of misapprehension has arisen on the subject of the capacity of these furnaces. It has been raised as an objection to the continuous process that, taking into consideration the size of the furnace employed, the output from it is little, if any, bigger than would be obtained from a fixed furnace of the same capacity. This, however, is an entire mistake, as the author hopes to show from the following considerations. The surface area at the bath level gives the best means of comparing the performance of one open-hearth furnace with another of different size. The following taole gives the surface area of several open-hearth furnaces, three of which are working the continuous process. Taking the Pencoyd furnace, with a surface area of 30 feet by 9 feet as the standard for a 70-ton furnace, the capacity of the others can be worked out as shown in the last column. It will be seen that whilst the

TABTE A.

WORKING IN THE 200-TON FURNACE AT JONES & LAUGHLINS, FOR WEEK ENDING FEBRUARY 21, 1903.

Heat Number.	Commenced Charging.	Heat Tapped.	Tap to Tap.	Cold Pig.	Liquid Pig.	Composition of Pig. Si.	Composition of Pig. S.	Scrap.	Iron Ore with 60% Iron.	Scale.*	Lime.	Ferro-Mang.	Product. Ingots.	Product. Scrap.	Carbon. Reqd.	Carbon. Obtd.	Phos.	Mang.	Sulp.
			hrs. mins.	Lbs.	Lbs.			Lbs.		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.					
12,673	10 p.m. on 14th	5·55 p.m.	.... ..	112,000	64,100	1·08	·060	220,600	800	4,500	10,600	300	41,600	2,000	·15–·20	·16	·028	·36	·047
12,673	6 ,, 15th	9·15 ,,	3 20	...	62,200	1·54	·050	...	700	4,800	8,225	500	102,800	...	·15–·20	·17	·030	·44	·046
12,674	9·20 ,, 15th	2·25 a.m.	5 10	...	103,800	0·98	·056	...	5,200	9,000	3,225	450	82,000	...	·15–·20	·21	·042	·51	·043
12,675	2·29 a.m. on 16th	6·25 ,,	4 0	...	79,100	1·15	·036	...	5,200	7,200	4,300	500	88,400	1,000	·15–·20	·16	·037	·46	·048
12,676	6·29 ,, 16th	11·10 ,,	4 45	...	89,400	0·99	·053	...	...	10,800	6,450	380	92,200	...	·15–·20	·19	·024	·40	·049
12,677	11·13 ,, 16th	3·10 p.m.	4 0	...	91,400	0·90	·060	...	...	11,700	5,375	380	87,080	...	·22–·26	·30	·025	·43	·055
12,678	3·13 p.m. on 16th	8·20 ,,	5 10	...	91,800	0·81	·064	...	2,600	10,800	3,225	500	87,700	2,000	·22–·26	·28	·028	·50	·057
12,679	8·27 ,, 16th	1·15 ,,	4 55	...	92,100	1·00	·045	...	2,600	11,700	4,300	500	60,550	29,300‡	·15–·20	·16	·027	·36	·062
12,680	1·20 a.m. on 17th	5·57 a.m.	4 42	...	87,400	1·10	·059	...	...	10,800	6,450	450	92,700	3,000	·15–·20	·17	·024	·43	·050
12,681	6·3 ,, 17th	10·10 ,,	4 13	...	79,600	1·10	·059	...	...	11,700	5,375	380	88,400	...	·15–·20	·16	·015	·38	·054
12,682	10·15 ,, 17th	2·35 p.m.	4 25	...	96,100	1·5	·049	...	1,400	11,700	6,450	380	93,600	...	·15–·20	·25	·013	·40	·052
12,683	2·38 p.m. on 17th	7·30 ,,	4 55	...	97,100	1·00	·040	...	500	12,600	4,300	450	88,400	2,000	·22–·26	·26	·023	·44	·049
12,684	7·33 ,, 17th	1·20 a.m.	5 50	...	110,000	1·00	·040	...	5,200	11,700	5,375	450	93,600	...	·22–·26	·25	·024	·45	·045
12,685	1·24 a.m. on 18th	6·40 ,,	5 20	...	97,800	0·90	·062	...	5,200	11,700	5,375	450	88,400	...	·15–·20	·17	·025	·48	·046
12,686	6·45 ,, 18th	11·40 ,,	5 0	...	95,200	0·80	·045	...	...	11,700	5,375	380	88,400	2,500	·15–·20	·23	·013	·39	·053
12,687	11·44 ,, 18th	3·45 p.m.	4 5	...	90,200	1·00	·048	...	...	11,700	5,375	380	92,950	...	·18–·24	·24	·018	·40	·055
12,688	3·49 p.m. on 18th	8·35 ,,	4 50	...	94,200	1·00	·047	...	2,600	11,700	4,300	450	100,800	...	·18–·24	·18	·021	·44	·048
12,689	8·40 ,, 18th	1·10 a.m.	4 35	...	110,800	1·14	·043	...	...	11,700	4,300	450	92,950	1,000	·18–·24	·23	·025	·51	·046
12,690	1·15 a.m. on 19th	6·20 ,,	5 10	...	82,300	1·19	·060	...	...	11,700	6,450	450	92,950	2,000	·18–·24	·19	·021	·45	·052
12,691	6·24 ,, 19th	11·8 ,,	4 48	...	95,100	1·25	·055	...	600	11,700	5,375	350	87,100	...	·15–·18	·19	·019	·38	·056
12,692	11·14 ,, 19th	3·25 p.m.	4 17	...	73,400	1·25	·055	...	...	12,600	5,375	400	93,600	1,200	·15–·18	·19	·016	·38	·051
12,693	3·28 p.m. on 19th	8·38 ,,	5 13	...	97,600	1·18	·045	...	2,600	12,600	6,450	400	87,400	...	·15–·18	·20	·016	·43	·047
12,694	8·42 ,, 19th	1·28 a.m.	4 50	...	89,300	0·98	·068	...	...	10,800	4,300	400	88,400	3,000	·15–·18	·21	·019	·54	·053
12,695	1·33 a.m. on 20th	6·35 ,,	5 7	...	93,700	1·05	·065	...	...	11,600	6,450	400	93,600	3,500	·15–·18	·16	·019	·38	·050
12,696	6·40 ,, 20th	11·35 ,,	5 0	...	98,700	1·19	·045	...	600	12,600	5,375	350	92,280	...	·15–·18	·17	·013	·38	·055
12,697	11·38 ,, 20th	4·15 p.m.	4 40	...	93,600	1·23	·040	...	...	11,700	5,375	380	92,280	500	·15–·18	·21	·021	·47	·050
12,698	4·18 p.m. on 20th	9·3 ,,	4 50	...	94,400	1·14	·047	...	2,600	11,700	6,450	400	88,400	...	·15–·20	·22	·019	·57	·045
12,699	9·7 ,, 20th	2·45 a.m.	5 40	...	89,600	1·04	·059	...	...	11,700	5,375	450	93,600	3,000	·18–·24	·18	·016	·55	·049
12,700	2·47 a.m. on 21st	7·5 ,,	4 20	...	84,600	1·25	·060	...	...	11,700	5,375	380	97,490	...	·18–·24	·22	·019	·43	·049
12,701	7·8 ,, 21st	11·40 ,,	4 35	...	127,500	1·30	·055	...	800	12,600	6,450	480	114,400	...	·40	·39	·025	·43	·057
12,702	12 ,, 21st	2 p.m.	2 20	...	30,000	...	...	...	5,800	...	2,150	450	121,550	2,000	·15–·20	·19	·025	·42	·063
12,703	2·5 p.m. on 21st	2·40 ,,	0 40	...	10,400	...	...	...	...	...	1,075	450	109,200	1,500	·15–·20	·20	·027	·42	·063
12,704	3·5 ,, 21st	3·25 ,,	0 45	...	9,800	...	...	...	2,600	...	...	450	104,300	2,100	·15–·20	·18	·021	·37	·058
12,705	...	4 ,,	0 35	...	...	...	...	...	...	...	...	400	83,200	5,600	...	·08	·024	·24	·062
34	...	...	4 17	112,000	2,799,300	1·10	·052	220,600	47,600	330,200	165,400	14,520†	3,102,400	67,200	...	...	·022	·44	·052

Metal tapped—Ingot and scrap . . . 1415·0 tons.
" charged, including ferro . . . 1404·6 "
Gain . . . . 10·4 "
=0·74 per cent.

* Dry scale with 70 per cent. iron and 0.10 per cent. sulphur.
† =10.2 lbs. per ton of ingot.
‡ Stopper in steel ladle failed.

TABLE B.

DETAILS OF CHARGE 12,677.

Charge. Time.	Name of Sample.	Weight of Metal.	Scale.	Ore.	Lime.	Analysis of Metal. Carbon.	Silicon.	Sul.	Phos.	Mang.	Analysis of Slag. Iron.	Silica.	Lime.
11.10 A.M.	Tapping slag and weight of metal left in furnace from heat 12,676	Lbs. 322,560	Lbs. ...	...	Lbs. ...	...	...	...	...	...	10·36	17·80	...
11.13 ,,	Added	...	10,800	...	...	...	...	...	...	...	...	...	...
11.34 ,,	,,	...	...	...	3225	...	...	...	...	...	...	...	...
12.5 P.M.	Analysis of bath and slag	...	...	...	...	·06	...	...	·009	...	31·74	12·20	...
12.10 ,,	Charged	46,000	...	...	...	4·00	·90	·060	·10	·65	...	...	...
	Calculated mixture	...	...	...	...	·55	...	...	...	...	...	...	...
12.17 ,,	Analysis after first reaction	...	...	...	...	·44	...	...	·009	...	22·93	18·80	35·30
	Percentage of reduction	...	...	...	...	20 p.c.	...	...	...	...	...	...	...
12.25 ,,	Added	...	1800	...	...	...	...	...	...	...	...	...	...
1.20 ,,	,,	...	10,800	...	2150	...	...	...	...	...	...	...	...
1.55 ,,	Analysis of bath and slag	...	...	...	...	·09	...	...	·009	...	29·59	15·0	...
2 ,,	Charged	45,400	...	...	...	4·00	...	...	...	...	...	...	...
	Calculated mixture	...	...	...	...	·51	...	...	...	...	...	...	...
2.9 ,,	Analysis of bath and slag	...	...	...	...	·48	...	...	...	...	20·58	18·70	...
	Percentage of reduction	...	...	...	...	6 p.c.	...	...	...	...	...	...	...
3.5 ,,	Analysis of bath and slag before tapping	...	...	...	...	·26	...	...	·023	...	9·06	24·40	40·90
3.10 ,,	Ladle test	...	...	...	...	·30	...	·055	·025	·43	...	...	...

Weight of ingots produced . . . . . 87,090 lbs.
Weight of scrap . . . .

Time from commencement of charging to tapping of heat, 3 hours 57 minutes.

TABLE C.

DETAILS OF CHARGE 12,697.

Charge. Time.	Name of Sample.	Weight of Metal.	Scale.	Ore.	Lime.	Analysis of Metal. Carbon.	Silicon.	Sul.	Phos.	Mang.	Analysis of Slag. Iron.	Silica.	Lime.
	Tapping slag and weight of metal left in furnace from heat 12,696	Lbs. 351,680	Lbs. ...	...	Lbs. ...	...	...	...	...	..	9·46	22·45	41·30
11.42 A.M.	Added	...	12,600	...	3225	...	...	...	...	...	...	...	...
12.33 P.M.	Analysis of bath and slag	...	...	...	...	·06	...	...	·009	...	40·58	13·20	...
12.40 ,,	Charged	40,000	...	...	...	4·00	1·28	·035	...	...	...	...	...
	Calculated mixture	...	...	...	...	·46	...	...	...	...	...	...	...
1.7 ,,	Analysis after first reaction	...	...	...	...	·15	...	...	·010	...	17·51	21·60	...
	Percentage of reduction	...	...	...	...	68 p.c.	...	...	...	...	...	...	...
1.45 ,,	Added	...	10,800	...	2150	...	...	...	...	...	...	...	...
2.7 ,,	Analysis of bath and slag	...	...	...	...	·06	...	...	...	...	33·76	13·80	...
2.35 ,,	Charged	38,000	...	...	...	4·00	1·18	·045	10	...	...	...	...
	Calculated mixture	...	...	...	...	·48	...	...	...	...	...	...	...
2.37 ,,	Analysis of bath and slag	...	...	...	...	·16	...	...	...	...	22·07	20·20	...
	Percentage of reduction	...	...	...	...	66 p.c.	...	...	...	...	...	...	...
3.25 ,,	Charged	15,600	...	...	...	...	...	...	...	...	...	...	...
4.10 ,,	Analysis of bath and slag before tapping	...	...	...	...	·19	...	...	·016	...	8·85	25·40	41·20
4.15 ,,	Finished heat. Ladle test	...	...	...	...	·21	·018	·050	·021	·47	...	...	...

Weight of ingots produced . . . . . 92,200 lbs.
Weight of scrap 500

Time from commencement of charging to tapping of heat, 4 hours 33 minutes.

three furnaces working the continuous process are fairly concordant, the others fall quite out of the running. For instance, the 50-ton Sharon furnace would be rated on this basis as a 100-ton furnace. The depth of the bath has not been taken into consideration in the above calculations, but the difference between any of the furnaces in question is comparatively slight. It is worth nothing that the output per week seems to increase fairly proportionately with the surface area a weekly make of 650 ton is obtained; the Pittsburg furnace again as the standard, from 270 square feet of surface area a waakly make of 650 tons is obtained; the Pittsburg furnace, with a surface area of 640 square feet, should on the same basis produce some 1,540 tons per week, which it bids fair soon to attain to, if it has not already done so before these lines are read. Their practice at Pittsburg is rapidly improving, and there seems no reason to doubt that their make will speedily increase, as has been the case both at Pencoyd and at Frodingham.

Name of Furnace.	Surface Area.	Rated as	Capacity, taking Pencoyd Furnace as Standard.
Pencoyd . . .	30'0" x 9'0" = 270 sq. ft.	70 tons.	70 tons.
Frodingham . . .	32'0" x 12'6" = 400 "	100 "	104 "
Jones & Laughlins .	40'0" x 16'0" = 640 "	200 "	*166 "
Campbell Basic Furnace	32'0" x 10'0" (mean) 320 sq. ft.	50 "	83 "
Donowitz " "	27'0" x 10'0" = 270 sq. ft.	30 "	70 "
Duquesne " "	27'0" x 14'0" = 378 "	50 "	98 "
Sharon " "	29'0" x 14'6" = 420 "	50 "	109 "

From the above it seems clearly a mistake to rate such furnaces as those at Sharon and Duquesne as 50-ton furnaces, if the Pencoyd furnace is to be rated as a 70-ton furnace. The authority for the above figures (except the continuous furnaces) are taken from Campbell's book already referred to.

TRADE PUBLICATIONS.

The "Wisdom" calendar sent out with the compliments of the Pratt & Whitney Co., of New York, is as far removed from the general run of reminders as it is from the New Year season. Each of the pages has something of business interest in addition to the date. One of the quotations reads as follows: "The package doesn't count after the eye's been attracted to it, and in the end it finds its way to the ash heap. It's the quality of the goods inside which tells when they once get in to the kitchen and up to the cook."

A reprint in book form of an article in the *American Machinist* by Charles H. Norton has been published by the Norton Emery Wheel Co., of Worcester, Mass. Mr. Norton has given some sixteen years to the exclusive study of grinding machines and abrasives and his opinion is of more than ordinary value. Copies will be sent freely to those interested in the latest word on rapid and accurate grinding.

The 1903 catalogue of the Cincinnati Planer Co., of Cincinnati, goes thoroughly into the construction of the planer and the account is improved considerably by the excellent halftones showing the machines as well as the shop. A chapter on the erection and care of "Cincinnati" planers is worthy the attention of users of this class of machinery, the suggestions being of general value, no matter the make of the machine.

The Moline Business Men's Association of Moline, Ill., has prepared a circular on the advantages of the city as a manufacturing center and the conditions favoring its further growth and development. It is interesting to learn that the Government has expended $25,000,000 on the arsenal at Rock Island and is employing 1,500 workmen there.

Circular No. 2 deals with the "Imperial" pneumatic tools made by the Rand Drill Co. of New York. The four pages are supplied with a number of fine halftones illustrating compressors, hammers, drills, bolt drivers and hoists.

The Standard Specialty Co. of New York has moved from 5th avenue to 542-544 West Broadway. A report from F. R. Hutton, of Columbia University, presents some surprising data in regard to the performance of the oil separator made by this company. Some interesting installations are treated in other publications.

The boilers and radiators made by the Pierce, Butler & Pierce Mfg. Co., of Syracuse, N. Y. are described in an elegantly illustrated catalogue of 120 pages. The description does not deal only with the construction of the manufactured goods but the plant is shown by a number of halftones of the various departments and processes utilized in the making of radiators and boilers.

The emery wheels, corundum wheels, grinding machines, emery wheel dressers, emery and corundum powders, saw gummers, etc., manufactured by the Vitrified Wheel Co., of Westfield, Mass., are freely illustrated in a recent catalogue. The pamphlet also contains a number of useful suggestions for ordering and using emery and corundum wheels. Some account of the old patent of Thomas Nelson on the manufacture of vitrified wheels is included and there is also a timely suggestion that applies to any make of abrasive wheel, that "there are a dozen or more ways by which a wheel may become injured from the time it leaves the factory to its being put on the machine by the user," and consequently a new wheel is never the worse for a critical examination and trial.

Several bulletins from the Fort Wayne Electric Works of Fort Wayne, Ind., treat of belt-driven direct current generators for lighting and power, single phase generators, arc circuit cut-outs and the installation and operation of direct current series arc lighting apparatus of the "Wood" system. All are profusely illustrated with halftone and line engravings.

The Binsse Machine Co., of Newark, N. J., has three recent pamphlets on shop equipment. One deals with the horizontal boring machine which is shown as applied to some uncommon uses, and incidentally a good case is made for the tool in the making of jigs and fixtures. The tool has the long range feed; it may be advanced a thousandth of an inch to try the cuting depth or it can be drawn back to measure the bore at the rate of a foot for each turn of the hand wheel. A separate pamphlet tells what other firms have done with the machine and the opinions expressed are backed up with some interesting figures. Another circular exploits a leveling jack made by this firm.

The Scully Steel & Iron Co., of Chicago, has issued the stock list for May and June. The list is exhaustive and includes twist drills and vises, bars, beams and wire rope, etc.

Catalogue A has an account of the new universal saw table of the Brown & Zortman Machinery Co., of Pittsburg. This machine is made in a plant building machine tools and has the massive appearance of a metal working tool. A number of halftones show the machine at work cutting out coreboxes, mitres, compound angles and segments, etc.

Catalogue A of the American Compressor Works, Havemeyer building, New York,, illustrates types of compressors, receivers, vacuum pumps, carbonic acid gas and high-pressure compressors and the "American" air lift pumping system. A table showing the flow of air through various sizes of orifices is included.

The "Ideal" die made by the Ideal Opening Die Co., of New York, is described in a small pamphlet.

"The Whisk" is the title of a breezy pamphlet published by the Indianapolis Brush & Broom Mfg. Co., of Indianapolis, Ind. The booming of a broom is the burden of the tale.

Narrow gauge railway materials are enumerated in catalogue 77 forwarded by Arthur Koppel, Broad street, New York. The material includes portable and permanent tracks, rails with all accessories, switches, frogs, turntables, cars, etc.

A recent circular submits the experience of a user with the line of Keller pneumatic tools made by the Philadelphia Pneumatic Tool Co., of Philadelphia.

The Railway Appliances Co., of Chicago and New York, is sending out a fine reproduction of a wash drawing of the Ajax diaphragm for vestibule cars.

The Stowell Mfg. & Foundry Co., Milwaukee, Wis., celebrated the completion of the addition to its machine shops, a few evenings since, by giving a concert to the employes and their families. During the evening Charles Sammond, secretary and general manager of the company, made an address in which he stated that the company hoped in time to erect a modern club house on its grounds, equipped with billiard tables, bowling alleys, library and lunch rooms. It is the intention to give from time to time concerts, lectures and other entertainments for the benefit of the employes.

THE HAESELER-INGERSOLL PNEUMATIC HAMMER.

A novel type of pneumatic hammer is being introduced by the Ingersoll-Sergeant Drill Co., of New York, under the Haeseler-Ingersoll patents. The special features are the valve mechanism for reciprocating the piston, a locking device for taking up wear and securely locking the handle, valve box and cylinder of the tool together, and a simple arrangement of throttle valve for controlling the admission of the air supply. The riveting hammer is illustrated in Fig. 1, which shows

As the movement of the valve is tranverse to the direction of the travel of the hammer or piston, the vibration of the entire tool is lessened in operation, and the action of the valve is not disturbed when the hammer blow is struck, but is quick, steady and uniform, and entirely free from fluttering or incomplete travel.

The valve is steel, made in one piece from solid stock, is hardened, accurately ground to gauges, interchangeable and guaranteed against any breakage from service. The valve box is also made of steel throughout, with all surfaces ground.

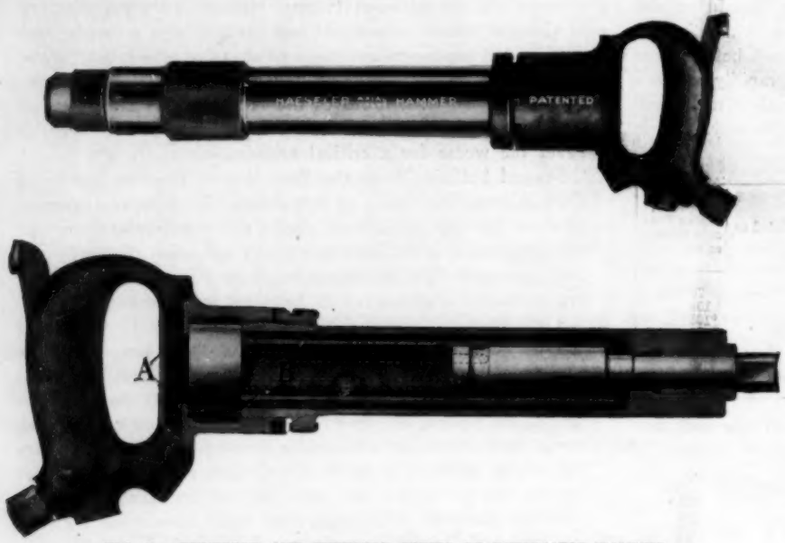


FIG. 1.—EXTERIOR AND INTERIOR VIEWS OF PNEUMATIC HAMMER.

FIG. 2.—THE AXIAL VALVE.

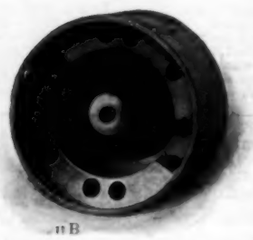


FIG. 3.—THE VALVE CHAMBER.

the exterior and interior views. The valve casing is seen in position between the cylinder and the handle. The air is received at the side A and distributed to the ports shown by continuous lines on the side B. The two ports shown by dotted lines conduct air from the cylinder back to the valve casing for the purpose of moving the valve.

The valve is a radial departure from the various forms of straight-line reciprocating valves. The movement is around a fixed axis or trunnion, the travel forward and back, to alternately open and close the admission and exhaust ports, being caused by a constant air pressure upon the short wing or projection of the valve and intermittent air pressure upon the long wing. Fig. 2 is the axial valve, and Fig. 3 shows the valve chamber. The ports in the valve, as well as those in the valve box, are relatively of equal areas, and are located diametrically opposite to each other, so that any pressure against either side of the valve is equalized by a corresponding pressure upon the other side, resulting in a balanced valve and consequent absence of friction and wear on the trunnion or axis about which the valve moves.

Figs. 4, 5, 6 and 7 show the respective positions of cylinder, piston, valve and the ports and passages through which they communicate with the supply and exhaust during the cycle of the moving parts. The valve is shown at right angles to the actual position for convenience of illustration. Fig. 4 shows the normal position of the valve with the piston at the commencement of the downward movement. The pressure against the short wing of the valve maintains it in the normal position until the piston reaches the point of stroke illustrated at Fig. 5. Here air is admitted under the longer wing of the valve and it is promptly rotated to the position shown, exhausting the upper end of the cylinder and admitting air below the piston. The piston strikes the bit-shank at the time the valve moves so that it is ready to move back to the position illustrated in Fig. 6. The piston has returned in Fig. 7 far enough to exhaust the space below the longer wing of the valve and the valve turns to the normal position as in Fig. 4 in time to cushion the piston and start it on another down stroke.

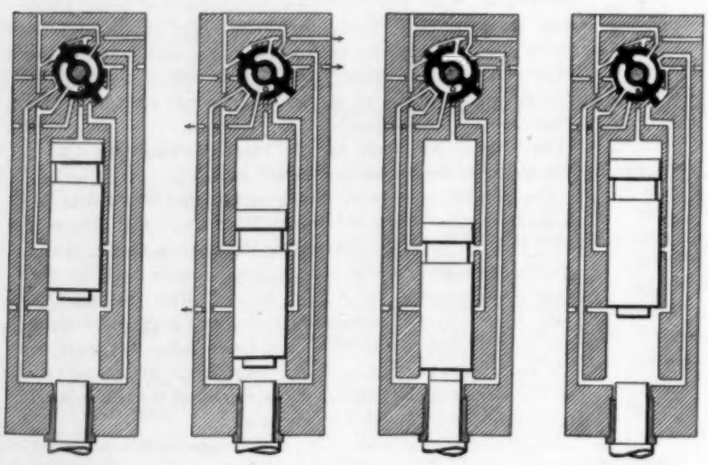


FIG. 4. FIG. 5. FIG. 6. FIG. 7.
POSITION OF PISTON, VALVE, AND PORTS AT DIFFERENT PARTS OF THE STROKE.

FIG. 8.—THROTTLE VALVE CLOSED.

Figs. 8 and 9 show the throttle opened and closed. The passages in the handle are all drilled out of the solid drop forg-

ing, the ends of the drill holes being afterwards plugged up. The valve is a simple poppet valve held to its seat by the air pressure, and opened by the handle passing down on the valve stem. The valve is returned to its seat by a light spring. The handle presses on the stem through an interposed steel ball, and a removable screw plug in the handle gives ready access to the valve and valve seat for inspection and repair. A pneumatic hammer is seriously impaired if the joints between the faces of the cylinder, valve box and handle are not kept tight. To insure keeping these joints tight and securely locking the parts together, there is a number of slots in the collar of the cylinder and a different number of notches in the end of the handle, the one number not being a multiple of the other. This arrangement permits a fine adjustment to be made when it is desired to take up the wear of the parts, as a notch in the handle will always be in line with one of the slots in the cylinder, without regard to any required position of the handle being necessary.

When the handle is screwed up tight, the parts are locked together by a key being inserted in the registering slot and notch referred to, and are held in place by a spring band being snapped over it and around the collar of the cylinder.

The pneumatic "holder-on," also made by the same company, takes the place of the dolly bar, used when hand riveting, and is intended for holding the head end of rivet up against the work while the hammer is upsetting and forming the other end. Its small size and light weight makes it suitable for use in restricted places, where the dolly bar can be used only with difficulty. The holder-on is shown in Fig. 10.

By the use of the duplex arrangement, with an inner piston having two faces upon which the pressure is exerted, the "set" is held against the rivet head with a pressure of about 900 pounds. The piston also has the advantage of a double guide, the better to resist the thrust under the heavy blows of the hammer.

FIG. 9.—THROTTLE VALVE CLOSED.

FIG. 10.—PNEUMATIC HOLDER-ON.

The New York Engineering Building.

At a meeting in New York of representatives of the five organizations named by Andrew Carnegie in his proposition to give to the four national engineering societies and the Engineers' Club a building for their joint use and occupancy, a form of resolutions, to be adopted by the respective governing bodies, was agreed upon and will be brought before the several organizations for action.

These resolutions provide that the American Society of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers, the Institute of Mining Engineers and the Engineers' Club unite in accepting the sum of $1,000,000 as a gift from Andrew Carnegie for the purpose of erecting suitable buildings for occupancy by various societies of engineers and the Engineers' Club on the sites secured for that purpose on the north side of 39th St. and south side of 40th St., west of Fifth Ave., New York City; that a site on the north side of 39th St. shall be purchased and held by trustees of the societies which vote in favor of coming into this enterprise; that a joint committtee shall be created, to be composed of three members of each organization; that the character and internal arrangement of the building to be erected on 39th St. shall be determined by the vote of at least two-thirds of the members of the committee other than those representing the Engineers' Club; that the character and internal arrangement of the club building to be erected on the site on 40th St. shall be determined by vote of all of the three members of such joint committee who shall represent the Engineers' Club on the joint committee; that the joint committee shall employ an architect to prepare the plans and specifications for the two buildings and shall also obtain proposals for the erection of both buildings and shall also have power to contract for the erection of the two structures.

Nova Scotia Steel & Iron Co.'s Plans.

The Nova Scotia Steel & Coal Co. has decided to remove a portion of its works from New Glasgow to North Sydney. At the end of the present year the company expects to have at least one plant at North Sydney completed. This announcement was made by John F. Stairs, of Halifax, president of the steel company, who said :

"With the plant completed we will more than double our present output of pig iron. But as soon as the plant is completed we will also have new works ready in which we will convert the pig into steel. With the establishment of such works at North Sydney, where our ore can be secured so easily, we expect to be able to manufacture at a lower cost. At the present time our entire output of light steel plates, hand rails, axles, etc., is sold, and if our output were much larger than it is we would not have any difficulty in securing a market for it. A number of satisfactory contracts have been made with manufacturing companies both in Toronto and Montreal, and in this way we have practically secured a permanent market. The company will hardly add any more mills until such time as we are certain that a market can be secured for the output."

The River & Rail Terminal Co., Pittsburg, has purchased from the American Steel & Wire Co. the Oliver-Roberts wire and nail mill on the South Side, Pittsburg, for $700,000, and will erect on the site twenty-three six-story warehouses at an estimated cost of $2,000,000. The sale necessitates the removal in August of the entire wire and nail plant to Denora, and this means the establishment in Pittsburg of one of the greatest warehouse systems in the country. The American Steel & Wire Co. has been planning for months to remove the wire nail machinery to Denora. Possession of the property in Pittsburg will depend to a considerable extent upon the condition of the wire and nail trade this summer. If the demand slackens up, opportunity will be taken of the dullness to move the machinery. It is expected, however, that the moving will not be done before August.

At the annual meeting of the stockholders of the Woodward Iron Co., held a few days ago at Birmingham, it was decided to go ahead with the building of the blast furnace, the foundations of which have been down for some time. The new stack will have a capacity of 300 tons per day, and an effort will be made to have it completed before next year. The stockholders elected the following board of directors: J. H. Woodward and G. B. McCormack, of Birmingham; A. H. Woodward, of Woodward; W. T. Bert, Wheeling, W. Va.; J. M. Vance, Wheeling, W. Va.; F. J. Hearn, Pittsburg, Pa.; S. Woodward, Providence, R. I.

In order to facilitate the handling of its Michigan business, the Field-Evans Iron Co. has established an office in Detroit, Room 809, Hammond Building, in charge of R. S. Fox.

NEW KEMPSMITH UNIVERSAL MILLER.

The latest model universal miller placed upon the market recently by the Kempsmith Mfg. Co., of Milwaukee, and shown in the accompanying illustrations, is made from entirely new patterns. The new tool steels make it possible to drive cutters at higher spindle speeds and the table with coarser feeds than when ordinary tool steels are used. To meet the new conditions thereby arising the spindle has been made heavier, cone steps widened, bearing surfaces on column knee and table increased and column itself widened and deepened. The result is a machine considerably increased in weight and well prepared by staunchness of construction to meet the tasks imposed by present day tool steels and modern methods of manufacture. Fig. 1 is a general view of the new miller.

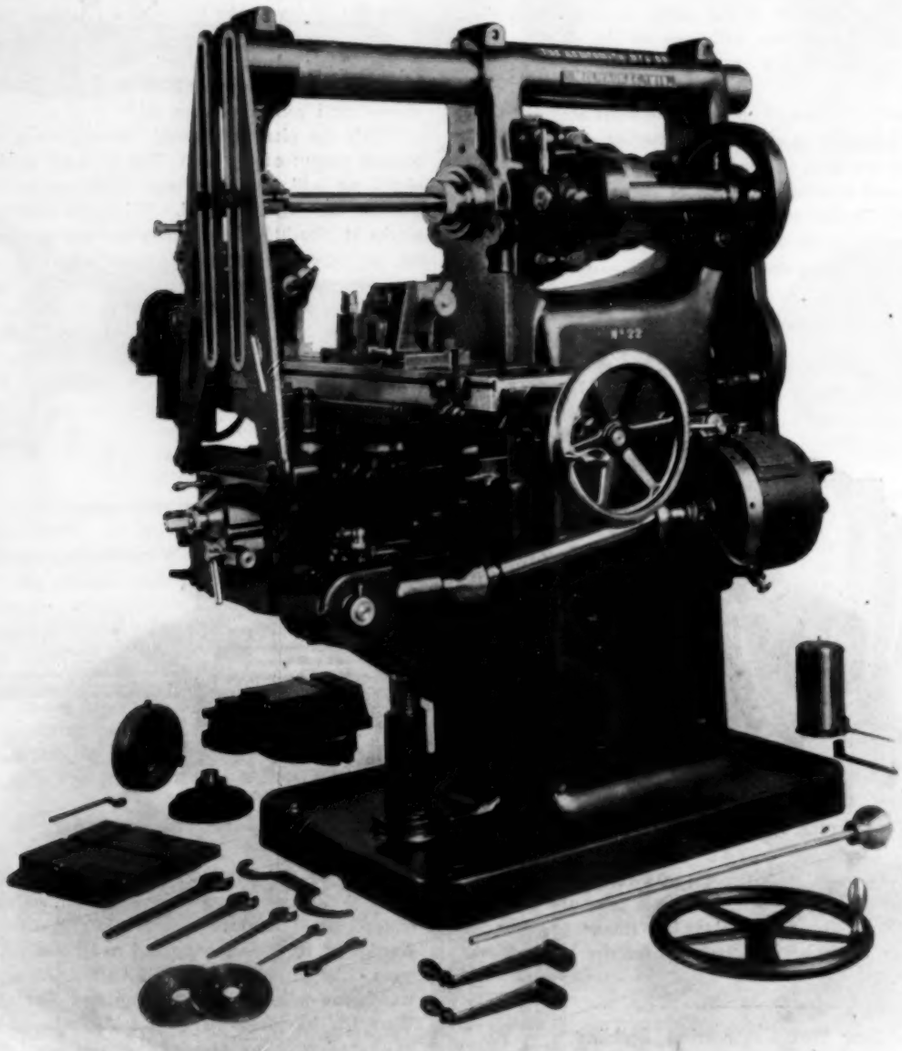


FIG. 1.—THE NEW KEMPSMITH UNIVERSAL MILLER.

The most desirable points of the miller it supersedes are retained and there are additional features which render it especially rigid as well as convenient in operation. The handles for engaging, tripping and reversing all the feeds are at the front of the knee within easy reach of the operator, so that he can observe the action on any work in hand and have the movements of the table under absolute control without moving his eyes from the work.

The method of arranging the spindle speeds and table feeds in geometrical progression, which has heretofore been used on Kempsmith millers, has been followed on these machines, as it is believed to be the best method in use. There are 16 spindle speeds obtained by means of the four-step cone pulley, back gears and double friction countershaft.

The 16 changes of feed are obtained by means of steel spur gearing in a box fastened in the side of the column at the rear. The feed change mechanism is therefore really made part of the miller, the box, it is claimed, not being subject to operating strains incident to an overchanging construction. Fig. 2, which is a view through the center lines of the gear shafts, shows the arrangement of the gearing. Fig. 3 shows that these gear shafts are not in the same plane in the machine, but they are so shown in Fig. 2 for the sake of clearness.

The feed is direct driven from the spindle of the machine by means of a chain to the sprocket wheel A which is keyed to its shaft. B is a sliding clutch operated by eccentric shaft C and lever No. 1 (Fig. 3), and may be engaged with either D or E, which in turn will transmit a fast or slow motion to cone gears on shaft F. Cone gears corresponding to those on shaft F are mounted on shaft G in swinging cage H. Cage H carries four intermediate or idle gears J, which are made to alternately engage in different pairs of cone gears by means of lever No. 2. Back gear K is mounted in cage H and drives pinion L. M and N are clutches keyed and pinned to shaft G. O is a sleeve with a helical groove on shaft G operated by lever No. 3 to engage either M or N. P is the universal joint connecting with the feed works in the knee through the telescopic shaft. An index plate showing all the feeds from .004 inch to .150 inch per revolution of spindle it attached to feed gear box

and indicates the positions of the levers for the desired feed. As the arrangement of the figures and letters on the index plate is in the same direction as the movements of the levers, the feeds may be read instantly.

on the arm without need of reversing it, as was necessary with the goose-necked type.

The vertical screw is now telescopic and permits lowering knee and table full distance of feed without need for screw hole in floor or foundation. The vertical or elevating screw has ball bearings for taking up the thrust.

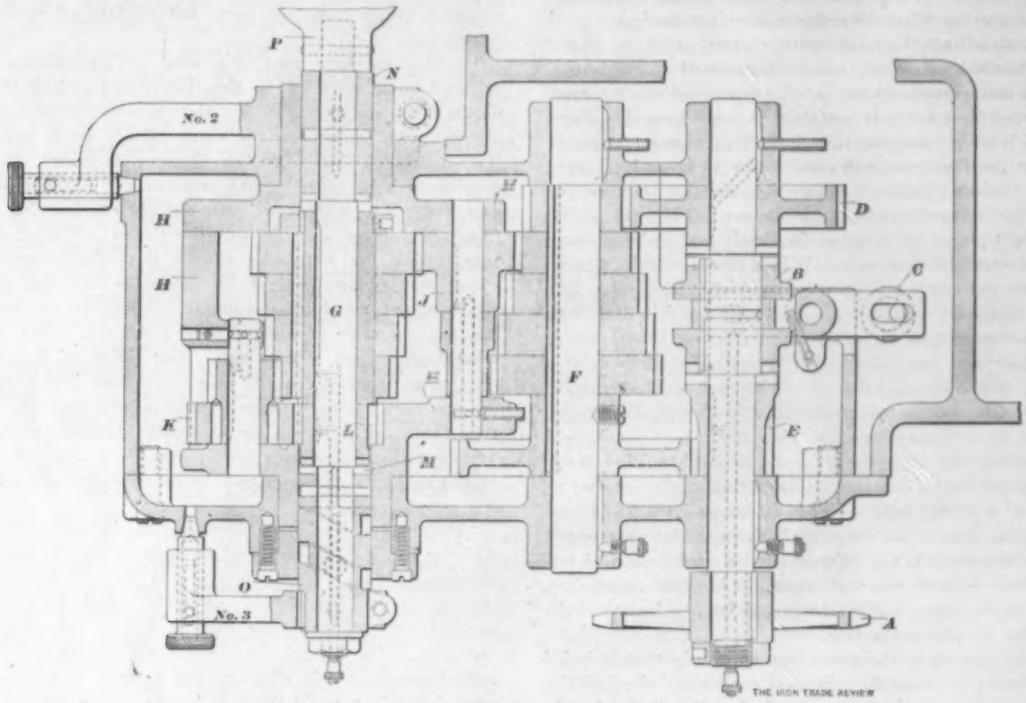


FIG. 2.—SECTIONAL VIEW THROUGH GEAR BOX

The straight overhanging arm, heretofore a feature of some Kempsmith plain millers, has now been adopted for the universal millers. The equipment of many shops being nowadays taxed to the limit, universal millers are frequently given manu-

FIG. 3.—GEAR BOX AND COVER.

facturing work rather than have them remain idle even for a short time. The straight arm may therefore be pushed back flush with face of column so that high pieces may be end milled close to table of miller, or the various attachments may be put

Eastern Tube Co. Receivership.

At Cincinnati May 21, Judge Thompson in the United States Court appointed William E. Guthrie and William Mattock, of Zanesville, receivers of the Eastern Tube Co., incorporated in West Virginia with a capital stock of $1,000,000 and with general offices at Zanesville, O. The receivers were asked for by the Central Iron & Steel Co., of Harrisburg, Pa., which claims that the liabilities are over $800,000 and that the assets consist of $40,000 in bank, $122,000 in bills receivable and $400,000 in the Zanesville plant and that other creditors join in asking for settlements. The receivers will continue the business.

In the proceedings it is stated that the tube company was capitalized at $1,000,000 and that stock to the amount of $565,000 was sold to various persons, while the rest of the stock was hypothecated to secure debts of the corporation. The liabilities are said to be $800,000, of which amount there is $60,000 overdue. In the statement of assets of the company, the plant at Zanesville is put down at $400,000; that the company has $40,000 in banks and $122,000 due on bills receivable. One of the principal reasons given for the naming of receivers is that the company has orders on hand for $500,000 worth of business, which can only be held by the operation of the tube plant.

The Burlington Foundry Co., Burlington, Kas., has bought out G. W. Reams & Sons of that city and proposes to move and erect a little larger plant. The company will do all kinds of machine work in both wood and iron, and also make all kinds of castings. The company is in the market for a drill and lathe.

The Ironsides Co., Columbus, O., reports that the business for its fiscal year just closed shows a gratifying increase, with favorable prospects for a further enlarged business in the coming year. The company manufactures and supplies special lubricants for wire ropes, fibre ropes, gearing and belting, a line of paints for metallic surfaces, and the Ironsides improved car wheel oiler.

MR. SWANK ON IRON TRADE CONDITIONS.

In the current number of the *Bulletin* of the American Iron and Steel Association, General Manager Swank gives the following extract from the Association's annual statistical report for 1902 and the early part of 1903, now in press:

"In our last annual report, which was printed in June, 1902, the opinion was expressed that, 'while a reaction from the great prosperity that now prevails is certain to come some day, from causes which no prophet can now foretell, it seems reasonably certain that the year 1902 will close under as favorable industrial conditions as signalized its opening and that they will be continued far into 1903 and perhaps longer.' The reasons for this hopeful opinion were given in detail, particularly those which related to the iron trade. It is a pleasure to be able to say that the extraordinary prosperity which prevailed a year ago has continued to the present time, and that it bids fair to continue for some time to come without serious interruption. No wise man will undertake to set metes and bounds to this prosperity. Upon the other hand a wise man will not neglect to observe the signs of overtrading or overproduction or be unprepared for a business reaction when it comes. Our Annual Reports during the past thirty years have chronicled many financial panics and visitations of hard times. Prosperous as this country is to-day and has been for several years it is not so prosperous that it can digest all the speculative schemes that are continually being offered to the credulous and unthinking. Nor is there room or excuse for business enterprises, otherwise meritorious, that are projected far in advance of the wants of the present generation.

"The interruptions to the general prosperity in 1902 included a general strike in the anthracite coal region and the inability of many leading railroads to promptly handle all the freight that was offered to them. No other strike of the year was either general or of far-reaching effect. The anthracite strike, which virtually closed all the anthracite coal mines of Pennsylvania, began on May 12, 1902, and lasted until October 23, of the same year, when there was a general resumption of work. During these twenty-three weeks little anthracite coal was mined and about 140,000 workmen were idle. The workmen lost about $25,000,000 in wages, the operators lost about $46,000,000 in sales, and the railroads lost about $28,000,000 in freight charges. These were serious losses. The shipments of anthracite coal in 1902 were 22,367,711 gross tons less than in 1901. The scarcity of anthracite coal from May to October greatly restricted the operations of Eastern iron and steel manufacturers.

"The railroad trouble mentioned was also of a serious character. Soon after the present boom in the iron trade got fairly under way at the beginning of 1899 it became manifest that the railroads which haul most of the raw materials and finished products of iron and steel were lacking in car and locomotive equipment, so that much of the freight to and from our iron and steel works could not be promptly shipped and delivered. Notwithstanding the efforts of railroad managers to meet this difficulty by ordering new rolling stock, the car and locomotive shortage continued and manufacturers' troubles increased. In 1902, with thousands of new cars and locomotives in service, a fresh difficulty presented itself, or, rather, a complication that had previously existed assumed an acute stage—there were not enough tracks and yard facilities to accommodate the increased rolling stock. Throughout the greater part of the year and until March of the present year the congestion of freight on many lines of railroad, especially those which run into Pittsburg, or which tap the Connellsville coke region, was a matter of daily occurrence. These lines had absolutely broken down! As one result of the inability of the railroads to promptly move coke, iron ore, pig iron, and finished products many consumers of iron and steel were compelled to send abroad orders that could otherwise have been filled at home. Another result was, of course, a smaller production of some forms of iron and steel in 1902 than would have been possible under more favorable conditions. Blast furnaces were often banked for many days at a time because a sufficient supply of coke or iron ore could not be obtained, and the mills were often operated on short time because they could not obtain a sufficient supply of pig iron or billets. From this condition there was but little relief until the spring of 1903. The extraordinary efforts of railroad managers to meet in every way the increased demand upon their roads have at last resulted in the virtual ending of the congestion we have described. Other industries were but slightly affected by this congestion.

"In May and June, 1902, so general was the opinion that the railroad managers would be able thereafter to supply the wants of the mills and furnaces, and thus enable our manufacturers to meet with promptness the extraordinary home demand for their products, that a further advance in prices, which had previously been of moderate proportions, was not generally expected. But stable conditions did not continue because the railroad problem was not solved. Prices for most products rose during the remainder of the year, but there was no sensational advance except for Connellsville coke, for some shipments of which raw material fabulous prices were paid. The present price of coke is $3.50 a net ton, which is somewhat higher than a year ago. The prices of iron ore for 1903 range from 25 cents to $1 a ton higher than in 1902. But the tendency has been toward lower figures since the close of 1902 for many iron and steel products, because, through improved railroad facilities and a steadily increasing capacity of production, orders can now be more promptly filled than a few months ago.

"As already mentioned, there was an increased demand in 1902 for foreign iron and steel products to meet a deficiency in the home supply. There was also a further decline in that year in our exports of these products. With an active home demand and higher prices this decline in our exports was inevitable. The increase in our imports of iron and steel had indeed commenced in 1899 and the decrease in our exports in 1901, but this turn in the tide became more marked in 1902 as the months passed. In the years immediately preceding 1899 our imports of iron and steel had greatly declined and until 1900 our exports had greatly increased; now the conditions were reversed. The foreign value of our imports of iron and steel in 1902 exceeded that of any year since 1891. In 1902 we imported 625,383 tons of pig iron, spiegeleisen, and ferro-manganese, 109,510 tons of scrap iron and scrap steel, 63,522 tons of rails, and 289,318 tons of steel billets, bars, structural steel, etc. At the present moment the indications are that in 1903 the imports of iron and steel will greatly decline as compared with 1902, but there is slight probability that our exports will increase. The home demand still taxes the capacity of our iron and steel works in all lines.

"Although, as has been explained, there was much interruption in 1902 to the continuous operation of our iron and steel works, the year's production of iron and steel was not only larger than that of any preceding year but it was very much larger, as was also the production of iron ore and coke. The shipments of Lake Superior iron ore in 1902 amounted to 27,571,121 gross tons, as compared with 20,589,237 tons in 1901, and the shipments of Connellsville coke amounted to 14,138,740 net tons, against 12,609,949 tons in 1901. The production of pig iron in 1902 amounted to 17,821,307 gross tons, against 15,878,354 tons in 1901; of Bessemer steel to 9,138,363 tons, against 8,713,302 tons; and of open-hearth steel to 5,687,729 tons, against 4,656,309 tons. It will not be many years, probably only one or two years, until this country will make one-half of all the pig iron and one-half of all the steel that the world produces.

"Labor in the iron and steel industries appears to be contented with its rewards, but in some other industries there is more or less discontent. In the iron trade, in the mining of coal, in the manufacture of coke, and in railroad transportation there have been material advances in wages in the last year."

The Colorado Fuel & Iron Co. is sinking a huge shaft on its property at Sunrise, Wyoming. An extensive plant has been established and it is said that the outlook for finding a large quantity of iron ore is very favorable.

The Columbia Iron Works, Port Huron, Mich., is preparing plans for one of the largest dry docks on the great lakes, to be built at its plant at St. Clair, Mich. The dock will be 550 feet long by 80 feet wide, with 20 feet over the miter sills.

ELIMINATING GASES AND SLAGS FROM MOLTEN STEEL.

BY F. C. WEBER.

Molten iron or steel being a solvent will hold the gases, carbonmonoxide, carbon dioxide, nitrogen, hydrogen, and oxygen in solution. The solvent power of molten metal is lost, of course, when the molten metal freezes. This freezing throws the gases out of solution, and these gases so thrown out of solution produce blow holes. Pressure, as liquid pressure, exerted upon molten metal increases the solvent power of the metal and the pressure being continued until the metal freezes the gases are retained, being distributed throughout the frozen metallic mass, as gases or gaseous molecules. Very heavy machines have been devised and are used to carry out this principle in practice, an improved metal resulting. There have been devised also a number of different methods to eliminate gases by creating a vacuum over the molten metal.

However, nothing practical has resulted from this. Fixing the gases contained in molten iron or steel, as chemical molecules, which occupy a space smaller by some thousands of times than when existing as gases, has also been accomplished, and principally when using metallic aluminum to quiet wild steel before teeming. This difference in space occupied by gases and by the latter when fixed as molecules is shown by the difference in one cubic foot of nitrogen weighing 518 grains, while one cubic foot of titanium-nitride weighs 323 lbs., the different space for N as gas or nitrogen, as $Ti_2 N_2$ being 1 to 4,350. The aluminum fixes the free oxygen and also reduces any free oxides in the molten metal which are reducible by aluminum; but Mueller has proven that the principal blow-hole producing element is nitrogen, with which aluminum does not form a nitride at the temperature of molten iron or steel. The aluminum goes no further than to eliminate the oxygen and some oxides, leaving the nitrogen and the gases, carbonmonoxide, carbon dioxide, and hydrogen to still make trouble for the metal worker. To eliminate nitrogen from molten iron or steel by fixing it as a nitride has long been the aim of metallurgists, as that offered the simplest way out of the difficulty. But to combine nitrogen, with its natural chemical affinities, so feeble outside of that for oxygen and hydrogen was a problem, indeed. Of all the elements boron and titanium are the only ones at all feasible, because boron and titanium form the desired stable nitrides. Boron nitride requires a temperature far above that of molten iron or steel for its formation, so that fixing the nitrogen of molten iron or steel as boron nitride is out of the question. This leaves the titanium a clear field, for a titanium nitride ($Ti_2 N_2$) does form at the temperature of molten iron or steel. The trick was to get a free, or, better yet, a nascent, titanium atom into the molten metal so that a nitride of titanium could form.

This I have accomplished by forming the ternary molecules either of manganese or iron with titanium and boron. These ternary molecules are dissolved and decomposed in the molten metal, furnishing the desired nascent atoms of titanium, and the boron's strong affinity for oxygen forms boron-trioxide, which then further acts as a fusible slag-forming element, eliminating that fractional percentage of slags always present in the molten metal, fluxing it out. These ternary borides are used in a very simple manner. In the form of a coarse powder they are thrown upon the bottom of the pouring ladle of a Bessemer plant, or into the pouring ladle of an open-hearth plant or into the bull ladle of a foundry, or into the crucible when treating crucible steel a few minutes before pouring. The molten metal in each case flows upon the ternary borides from the Bessemer converter, the open-hearth furnace or from the cupola.

The metallic boride at once goes into solution and chemical reaction immediately takes place, requiring but a few minutes to be complete. These chemical reactions remove the residual oxygen from Bessemer steel after the ferro-manganese or spiegel has acted and the nitrogen and also the trifling amount of silicate slags and oxides always present in molten iron or steel. These same reactions obtain in Bessemer steel, open-hearth steel, crucible steel, and cast iron according to their several natures, depending upon the varying amounts of these impurities contained in each kind of metal. It will be required, however, to add additional amounts of titanium alloys in almost every case in varying amounts. The manganese and iron titanium borides are definite chemical molecules while the gases are not present in constant amounts. A pure alloy of iron and titanium or of manganese and titanium is serviceable in most cases. These additions, however, must be of titanium alloys free from carbides and of silicides, as these last are inert, becoming impurities when added to molten metal.

This pretty nearly bars alloys of titanium made in an electric furnace, using carbon electrodes to form the arc. Titanium carbide and titanium silicide form at the temperature of the electric arc carbon, while silicon is always present. The arc being formed by using carbon electrodes, these carbides invariably contaminate the ferro-titanum alloys made in the electric furnace. At times the titanium of these ferro-titanium alloys is present almost wholly as either a carbide or as a silicide. When the gases oxygen and nitrogen are fixed as borates and nitrides there still remain the carbon oxides and the hydrogen, but since the resistance to pressure of a mixture of gases is that of the sum of their pressures and not their mean, it follows that solid metals result free from blow holes from this decreased resistance. This I have proven in practice. Then there is still an open question, viz.: having removed the nitrogen from molten metal, reducing the resistance to pressure, does the freezing metal squeeze out any of the remaining gases by its contraction during cooling down to the freezing point of the metal or retain the gases by occlusion?

The making of titanium compounds was only made feasible by the high temperature capable of production by the electric arc, titanium being the most infusible metal known. It follows that the amount and intensity of caloric required to form titanium alloys and compounds was beyond that capable of production by ordinary carbon combustion. This has retarded progress in utilizing titanium in metallurgy. Since carbon electrodes contaminate products formed by using them, and as all electric furnaces use them, it remained to utilize the latent heat of stability of metallic aluminum to furnish means of decomposing titanium minerals, such as rutile, ilmenite, and mennaconite, and of then forming alloys and new compounds.

This I have successfully accomplished. This method furnishes carbonless alloys and compounds which can be formed, having a definite chemical composition. These titanium products furnish nascent atoms by decomposition and then these nascent atoms form new and definite nitrides. Utilizing these titanium products will better the quality of Bessemer, open-hearth and crucible steel, and of cast iron, and by so improving their quality will in turn improve all products made from these several steels and iron in every case. Nitrogen is not present in untreated steel as a nitride. It is present, however, at times, as ammonia, which is said to be recognized by its smell. The removable nitrogen present in iron and steel is present in the non-combined gaseous form. The amount present is stated to vary from two to over twenty times the volume of the metal. Bessemer steel after teeming while cooling fairly hisses from escaping gases. Molten iron or steel, which is low in nitrogen, however, absorbs nitrogen from the air and from this property of the molten metal, molten iron or steel may be called "nitroscopic," to coin a word expressing this recognized condition. Because of this "nitroscopic" property of molten iron and steel the treatment to eliminate the gases must be had at the end of working the metal. For instance, adding the boron compounds and the titanium alloys to the molten metal in the mixer of a Bessemer plant and then blowing the molten steel will not cleanse the metal.

The amount of nitrogen present varies with each kind of metal, and to eliminate the nitrogen and oxygen no fixed rule for using borides and titanium alloys can be laid down. Each metal will have to be treated by itself.

The object in each case will be to fix that portion of the nitrogen which causes the trouble and render it harmless. The nitrogen contained in iron and steel varies from crucible steel, which is lowest, to cast iron next, open-hearth steel still more, to Bessemer steel which has the most. The amount varies in these metals from two volumes to over twenty; from about 400 grains per ton in cast iron to over 3,000 grains per ton in Bessemer steel. Of this contained nitrogen only, the major portion can be removed. Absolute chemical purity is not attainable. The gases to be removed in practice will be what are termed the mold gases.

Since the reaction of these titanium and boron compounds

removes the nitrogen and oxygen present in molten iron and steel by fixing them as chemical compounds it is essential that the boron and titanium compounds and alloys be added in such amounts as to do this by atomic proportions; and this necessitates the use in combination in most cases of boron compounds and titanium alloys. The amount of oxygen in iron or steel is probably less than three volumes of gas to one of metal; for one-half ounce to one ounce of aluminum will quiet wild steel. This would show that nitrogen is present in from two to six times the volume in which oxygen is present; i. e., the solvent power of iron or steel is from two to six times as great for nitrogen as it is for free oxygen. The titanium alloy with manganese does not furnish nascent atoms, but it dissolves in the molten metal. The titanium becomes free and forms a titanium nitride molecule, more slowly than the nascent atoms from the metallic borides, but still rapidly enough so that the reaction is had before the molten metal freezes.

Chicago, Ill.

DOMINION IRON & STEEL CO.

At the annual meeting of the shareholders of the Dominion Iron & Steel Co., held at Montreal last week, Senator George A Cox presided and in the absence of the president presented the following report on behalf of the shareholders:

"By the terms of the lease entered into between this company and the Dominion Coal Company, Limited, which was duly ratified and approved by the shareholders of the two companies, the Dominion Iron & Steel Co., Limited, has leased the entire property of the Dominion Coal Co., having entered into possession thereof as at 1st March, 1902. The report which your directors have therefore to present embraces only eight months' operations of the steel department and ten months' operations of the coal department (the leased property). The directors would point out that while there is a surplus on the company's operations for these periods, after paying dividend on preferred stock of $309,612.88, there have been expenditures on capital account amounting to $1,730,887.43, which expenditures in the case of the steel department were following out the general plan for the completion of the plant, and in the case of the coal department were chiefly for development work at the mines and for shipping facilities all of which have greatly enhanced the earning capacity of the company's properties.

"The output of pig iron for the eight months was 148,399 tons or an average of 18,550 tons per month. The output of steel billets was 81,513 tons, or an average of 10,189 tons per month. The result of the operation of the company so far is to prove that its plant is able to produce pig iron and steel, which meets the most exacting requirements of its customers. These include nearly all the important manufacturing plants in Canada and some of the largest locomotive work and plate mills in the United States. The sales for the ten months amounted to 2,836,321 tons, an average of 283,632 tons per month as compared with 2,276,270 tons for the corresponding ten months of the previous year, an average of 227,627 tons. Development work has been fully carried out and the prospects for the present year are excellent. Notwithstanding the unfortunate fire at Dominion No. 1 Colliery in March last, now it is believed extinct, the output from Jan. 1 to May 1 in the current year is 966,097 tons as compared with 881,714 tons in the same months of 1902."

The annual statement ending December 31, 1902, being eight months for steel department and ten months for coal department, follows:

Earnings Coal Department, 10 months		$1,977,328 10
Less 10 months' rent		1,333,333 33
Net		$643,994 77
Earnings Steel Department, 8 months		309,886 90
Total		$953,881 67
Less—		
Bond Interest, 8 months	265,376 94	
General Interest, 8 months	112,225 17	
Sinking Fund, 8 months	33,333 34	
		410,935 45
Net Operating Earnings		$642,946 22
Less—		
Preferred Stock Dividend, 8 months		233,333 34
Surplus		309,612 88

ASSETS.

Property	$33,465,257 17	
Cash and Accounts Receivable	2,491,675 23	
Raw and Manufactured Material on hand	2,229,072 82	
Insurance, Taxes, S. S. Hire, etc., paid in advance	52,896 01	
Coal Rental, 2 mo. paid in advance	266,666 67	
		38,505,567 90

LIABILITIES.

Bonds	$ 7,946,000 00	
Common Shares	20,000,000 00	
Preferred Shares	5,000,000 00	
Cape Breton Real Estate Debentures	360,880 00	
Dominion Rolling Stock Debentures	270,879 96	
Mortgages	72,000 00	
Notes and Accounts Payable	4,274,733 26	
Interest, Dividends, etc., accrued and not due	204,469,85	
Contingent Fund	66,991 95	
Profit and Loss	309,612 88	
		$38,505,567 90

CAPITAL EXPENDITURE.

Expended for new construction Steel Department for 8 months from May 1, 1902, to January 1, 1903		864,626 46
Expended for new construction Coal Department for 10 months from March 1 to January 1, 1903, as follows:		..
At Collieries	$631,714 74	
At Montreal	9,044 02	
At Quebec	502 21	
		641,260 97
		$1,505,887 43
Other Capital Expenditures as follows:		
St. John Wharf Property	100,000 00	
Sydney & Glace Bay Railway Capital Stock	125,000 00	
		225,000 00
		$1,730,887 43

It was decided to add three new directors to the board, the new members being E. S. Clouston, general manager of the Bank of Montreal; Frederick Nicholls, president of the Niagara Power Co., and general manager of the Canada Foundry Co., Toronto, and F. H. Plummer, of Toronto, vice president of the Mexican Light & Power Co.

The company has not concluded arrangements for the establishment of a ship building plant and dry dock and probably will not be able to make any definite announcement on this subject for some time.

Canadian Rolling Mills Consolidated.

The Montreal Rolling Mills Co., Montreal, has purchased the property and good will of the Pillow & Hersey Mfg. Co., of the same city, the purchasing price being $600,000. E. S. Clouston, general manager of the Bank of Montreal, has been chosen president of the consolidated companies, and Wm. McMaster, general manager of the Montreal Rolling Mills Co., will be general manager of the new company. It is intended that the entire works of the Pillow & Hersey Mfg. Co. will be retained, improved and extended.

The Montreal Rolling Mills Co.'s works are at Ste. Cunegonde and were built in 1857. They were destroyed by fire March 24, 1900, and immediately rebuilt. They consist of 6 coal and 3 gas heating furnaces, 3 trains of rolls (9-inch, 12-inch and 18-inch) and 75 cut nail and 65 wire nail machines; product, tack, bar and horseshoe iron, nail plate, skelp, horseshoes, horseshoe nails, cut nails, wire and steel wire nails, tacks and wire; annual capacity, 16,000 gross tons of bar and horseshoe iron, 10,000 tons of skelp, 5,000 tons of nail plate, 30,000 tons of horseshoes, 25,000 boxes of horseshoe nails, 100,000 kegs of cut nails, 7,500 tons of wire and 100,000 kegs of wire nails.

The Pillow & Hersey Mfg. Co. has rolling mills, cut nail, spike, and horseshoe works, tack, bolt, wire and wire nail works. The company was established in 1859. It has 18 furnaces, 4 trains of rolls, 96 cut and 36 wire nail machines; product, cut nails, wire, wire nails, bar iron, railway and pressed spikes, horseshoes, tacks, bolts, nuts, rivets and washers; annual capacity, single turn, for cut nails 118,000 kegs, for wire nails 75,000 kegs.

The Bendit Mercantile Engineering Co., of St. Louis, announces the election of E. O. Edson as its secretary and treasurer. F. C. Laufketter retires to become president of the Victor Mfg. Co., of St. Louis. The company carries on an engineering and contracting business.

HOIST SERVICE IN THE DEERING FOUNDRY.

A very interesting installation of two special five-ton, two-motor, traveling electric hoists has lately been made in the No. 2 foundry of the International Harvester Co., Deering Division, Chicago, by Pawling & Harnischfeger, of Milwaukee. The accompanying view shows the two hoists, the plan of support, and suggests the service. The foundry is 820 feet long by 80 feet wide, with an L 60 by 80 feet. The cupola is at the side of the center of the main floor, with 400 feet to be served by each machine, or both hoists working at one end, if found desirable.

Castings for agricultural implements are necessarily small, but of great variety and very large quantity. To cast these to advantage, and properly to care for the molten metal, requires apparatus capable of very rapid work.

For these castings the hoists are used only to carry the reservoir ladles from which the smaller ladles are filled, either to be poured to the molds direct, or to attach to small hand cranes, which work on each side of the hoist runway. The two inner runways for the crane will be noted paralleling the hoist I-beam.

These hoists are capable of a maximum speed of 500 feet per minute under full load and 600 feet when running light. The capacity is five tons, with a total lift of 17 feet, which is accomplished at the rate of 40 feet per minute under full load and 90 feet running light.

There being but a limited clearance between the floor and the bottom chords of the roof truss, Pawling & Harnischfeger designed a special type of hoist to gain the required lift. Contrary to the usual plan of suspending the drum beneath a cast steel hanger frame, the two International hoists have the drum placed close to the I-beam runway by means of a channel steel frame. This change from the standard, and suspending the drum tween these channels, required that the hoist gearing with the load brake be placed at the opposite end of the machine than is usually employed. The cage for the operator is so designed and attached as to protect him from the heat from the ladle and at the same time to permit a view of all work requiring his attention. Direct current of 220 volts is used and conveyed to the machine through two trolley wires attached to, but insulated from, the top flange of the I-beam. The cage contains all the controlling mechanism, switchboards, fuses, etc.

SPECIAL TRAVELING ELECTRIC HOISTS IN THE NO. 2 FOUNDRY, INTERNATIONAL HARVESTER CO., DEERING DIVISION, CHICAGO.

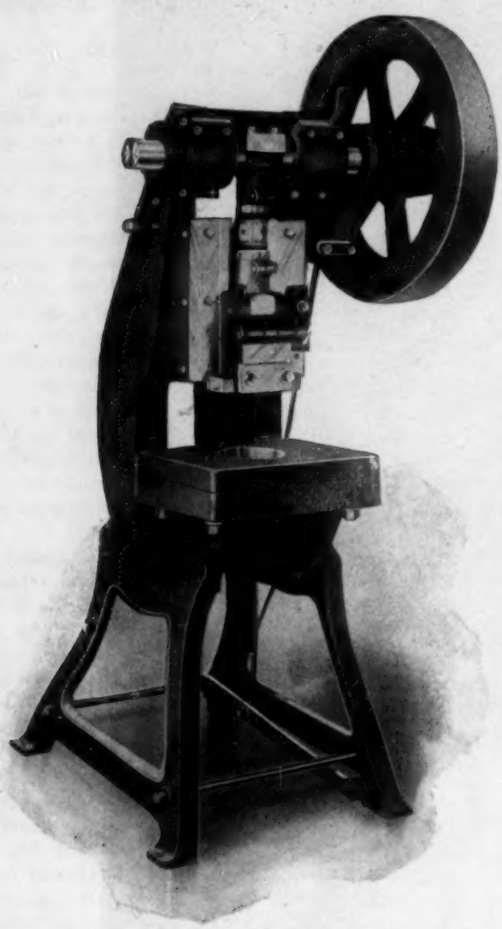
Swivel tracks are used upon these hoists, capable of taking curves of not less than 15 feet radius, and, in the entire length of the runway of 1,100 feet, there are four curves and five switches. A curve with two switches is placed in front of the cupola house. From the main runway at the entrance to the L are placed two switches and two curves, the L being

used as a rattling room. The hoists are of much service in carrying castings to this rattling room, the view showing such a load attached to one hoist.

A further advantage in using these hoists arises in taking the switch and runway to a landing platform at one side and end of the building, permitting the carrying of sand, molds, flasks, etc., to any point within the building, or the delivery of castings to wagons for conveyance to other departments.

SHEET METAL PRESS.

A new sheet metal press is being put upon the market by the Wm. C. Johnson & Sons Machinery Co., of St. Louis. The shaft is made of forged steel and the flywheel is extra heavy with a bearing on the shaft of 9x2½ inches. There is a safety stop shown at the top of the frame which serves to lock the clutch absolutely and this can be put in action without need of the operator leaving his seat. A matter of consider-



A NEW SHEET METAL PRESS.

able importance in connection with the rapid and safe handling of die work and dies. There is also an automatic knockout which may be adjusted by the workman without changing his position. The press may be easily inclined to any position up to 40 degrees. The bolster plate is fastened with four bolts with countersunk heads and the bolts will not turn in holes. The guides are extra long and all cap screws subject to wear are hardened.

The general specifications show that the total weight is about 1,750 pounds ; opening in bed, 8¼x9¼ inches; standard stroke, 2 inches; and floor space, 26x34 inches.

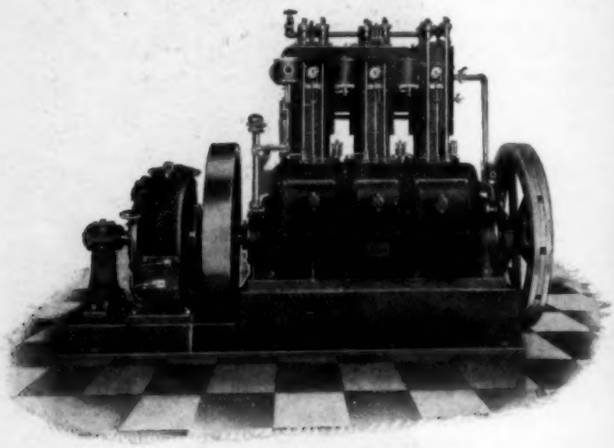
The Remington Typewriter Co., Ilion, N. Y., has announced its decision to give all employes who have been connected with the company for ten years or more a bonus of $100 a year to be paid in installments of $50 every six months, on June 1, and at Christmas. This applies to all men who have completed the ten years of service and others as fast as they shall reach that point. At the present time 257 men are qualified to receive the bonus.

WALRATH GAS ENCINE.

The latest type of "Walrath" gas engine manufactured by the Marinette Iron Works, of Marinette, Wis., is shown in the engraving. This machine is a three cylinder, 50-h. p. engine direct connected to a Western Electric generator and is of the four-cycle type. This class of engine receives an impulse on the two cylinder engine every revolution and on the three cylinder type every two-thirds of a revolution. The company builds single cylinder engines for general power purposes from 4 to 40-h. p. The engines for electric lighting purposes are in two cylinder type from 8 to 80-h. p. and three cylinders from 50 to 125-h. p. The larger percentage of the engines built are installed for electric power and lighting and 50 percent are direct connected, either with solid shaft and armature pressed into place or with coupling. The engines are governed on the throttling governor method which controls the amount of explosive material furnished each cylinder rather than the omission of explosions.

The valves, inlet and exhaust are both placed in the head and present a clean explosion chamber without recesses in which foul matter can accumulate and cause trouble. The positive motion for these poppet valves is obtained from a single cam shaft which is located in the base of the engine and is given motion by a train of gears. This places the gears and cams in the base where oil is carried and lubrication is supplied by the splash system.

The crank shaft of the engine is set in removable bearings



THE LATEST TYPE OF WALRATH ENGINE.

lined with genuine babbitt metal and any of the bearings may be removed without disturbing the shaft. The base being bored to receive the bearings insures perfect alignment and absolute interchangeability. The crank pin bearings are of the best phosphor bronze as is also the piston pin bearings. All the working parts of the engine are easily accessible by the removal of cover plates in the front or back of the base, these being directly in line with the moving parts.

The manifold exhaust is a feature of the new engine. This manifold is kept cold and the exhaust muffled by admitting into the manifold a portion of the discharged water from the cylinder jackets.

Three vessels have recently been unloaded by new machinery on the Hanna docks at Ashtabula. The clam shell buckets attached to the King machines with scrapers in the holds, worked by electricity, comprise the new outfit, and by this combination every pound of ore is removed from the vessel without the aid of a shovel. The unloading has proceeded very satisfactorily.

The Struthers Furnace Co. has been compelled to blow out its furnace at Struthers, O., to reline. Under ordinary conditions the lining would have lasted fully a year longer, but the frequent banking of last year, necessitated by failure to obtain adequate supplies of coke, caused the fire-brick to burn out more rapidly. The furnace will be out of blast for about a month.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Belleville Foundry Co., Belleville, Ill., has increased its capital stock from $15,000 to $30,000.

The Kalamazoo Valve Co., Ltd., Kalamazoo, Mich., has been incorporated with a capital of $30,000, of which $12,000 is paid in.

The F. G. Johnson Co., Hartford, Conn., has been incorporated with a capital of $5,000 to manufacture tools, dies, forgings, etc.

The Bagley Grader Co., Tacoma, Wash., has been incorporated with a capital of $10,000 to manufacture, deal in and operate graders and grading machinery.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., has increased its capital stock from $500,000 to $750,000. The additional quarter of a million is already largely subscribed and will soon be paid in.

The West Michigan Machine & Tool Co., Ltd., Grand Rapids, Mich., has been incorporated with a capital of $10,000.

The Fitzhugh-Luther Co., Chicago, capital $250,000, has been incorporated to manufacture locomotive engines, cars and machinery. The incorporators are: Carter H. Fitzhugh, Frederick P. Luther and Silas H. Strawn.

As a result of the efforts of the Something Doing Club, an industry of Winona, Minn., which has been conducted in a small way for a number of years, is to be placed on a firmer foundation. The plant of J. H. Schoonmaker, manufacturer of cables, has been taken over by a new concern, to be known as the Winona Wire Cable Co., with Mr. Schoonmaker as vice president and superintendent. The business will be continued on an enlarged scale.

The Stamping & Tool Co., La Crosse, Wis., capital $10,000, has been incorporated by Eugene P. Gleason, Dr. C. W. Farrand, and M. C. Munson. The company will do electroplating, will make dies and tools and will do stamping.

Dr. D. O. French, of Frankton, Ind., and John W. Dwiggins, of Kokomo, Ind., are about to establish a plant at La Fayette, Ind., for the manufacture of wire fences.

The Johnson Printing Press & Foundry Co., Elkfalls, Kansas, capital $50,000, has been incorporated to manufacture printing presses.

Fires and Accidents:—

Fire at the plant of the Northern Iron Works, Winnipeg, Manitoba, May 13, caused a loss of about $20,000.

The two boiler plate mills of the Central Iron & Steel Co., Harrisburg, Pa., were destroyed by fire May 22, causing a loss of $200,000 and throwing a large number of men out of work. The loss is covered by insurance. The mills had recently been rebuilt.

The plant of the Waterous Engine Works Co., St. Paul, Minn., was destroyed by fire May 22. Loss $75,000, partially covered by insurance.

Part of the plant of the Hoyt Metal Co., St. Louis, Mo., was destroyed by fire a few days ago; loss $30,000. The destroyed building will be rebuilt.

Moore Bros.' foundry and machine shop, Elizabeth, N. J., was damaged by fire to the extent of $2,500, May 19.

New Construction:—

The Union Steam Pump Co., Battle Creek, Mich., is building a foundry building, 240 feet long and 90 feet wide, entirely of brick and steel. It will be completed in about sixty days and will start with fifty employes.

The American Radiator Co. has signed contracts with the citizens of Litchfield obligating that company to build a plant for manufacturing radiators in that city. The deal has been under way for some time past. The company will begin at once to erect a building at a cost of $150,000, and the plant, according to agreement, is to be in running order Oct. 1. A belt line railroad connecting the different railroads running into Litchfield is to be built.

A. W. Hight, proprietor of the Washington Pulley Co., Seattle, Wash., will add a drop forge plant to his works in that city. The new plant will be 60x140 feet.

Messrs. Beeman & Joseph, of Louisville, Ky., who recently purchased the M. Zier Boiler Co. plant at New Albany, Ind., have taken possession of the property and commenced the work of improving it. The capacity of the plant will be increased and a considerable amount of new machinery will be added. Michael Zier, former president of the M. Zier Co., has been engaged as superintendent of the plant.

Dahmen, Grell & Co., Little Falls, Minn., are building a machine shop 38x120 feet.

Messrs. Thos. and R. E. Calhoon will establish an iron and brass foundry at New Brighton. They will erect a building 100x40 feet and expect to have the plant in operation at an early date.

Messrs. Frazer & Jones, Syracuse, N. Y., are building an extension to their foundry plant.

The Jeffrey Mfg. Co., Columbus, O., has had plans prepared for a two-story brick tool shop 50x114 feet. The cost will be about $15,000.

The Eureka Foundry Co., Rochester, N. Y., is about to erect an entirely new plant, the main building to be 120x75 feet, this building to be in two spans 50 and 25 feet. The 50-foot span is to be covered by an electric traveling crane with a capacity of 10 tons, having a travel of 120 feet. This foundry will have the most up-to-date and heaviest equipment of any foundry in the city of Rochester. The designs are by Mr. Henry A. Boyd, M. E., of Buffalo. The cupola and crane are to be furnished by the Whiting Foundry Equipment Co., Harvey, Ill. The line of work will be heavy machinery casting of the finest gray iron.

The Toledo Wood & Metal Pattern Works, Toledo, O., recently incorporated, will this summer erect a building at Summit and Walnut Sts., 30x100 feet, brick, two stories.

The Cleveland Automatic Stoker Co. has leased temporary quarters at Toledo, O., and expects to build a plant in that city next fall.

The Bradford Machine Tool Co., Cincinnati, whose pattern shop was recently visited by fire, will rebuild, adding several new structures, but the company has not yet decided on any definite plans.

The buildings to be erected by the Lehigh Valley R. R. at Sayre, Pa., are four in number. One of the main buildings will be a machine and boiler shop. It will be 794 feet long and 366 feet wide, and will cover six acres of land. There will be a storehouse 360x103 feet, a blacksmith shop of the same dimensions, as well as a power house, 300x100 feet. The shops will be equipped with the most improved machinery and the power to be used is electricity. All heavy work is to be concentrated at Sayre when the plant shall be in readiness for operation. The grading of the shop site is to be completed by Aug. 15, when the builders will begin their part of the work. The improvement, complete and ready for business, will represent an expenditure of $3,000,000.

The plant formerly owned by the Anniston Rolling Mill Co., Anniston, Ala., and purchased by the Weller Rolling Mill & Forge Co. some 30 days ago, now has a capacity of 40 to 50 tons of finished iron per day. The company expects, in the near future, to increase the output to a considerable extent by the addition of an 8-inch mill. The company also contemplates putting in a forge plant some time in the near future.

The Michigan Sprocket Chain Co. has received bids for the erection of a building 104x80 feet at Delray, near Detroit. Malleable iron sprocket chains for agricultural machinery, mining, hoisting and elevator purposes will be made. The material will be furnished by the Michigan Malleable Iron Co., near whose plant the new building will be erected. The railroad facilities are excellent. The stockholders are: T. H. and J. L. Simpson, G. M. Black and Lewis Nelson.

The Dover Forge & Iron Co., Canal Dover, Ohio, expects to commence the erection of a plant July 1.

The buildings of the Manitoba Iron Works, Ltd., Winnipeg, Manitoba, are fast approaching completion. They are as follows: Machine shop, two stories, 60x125 feet; foundry, 50x80; boiler shop, 40x60; pattern shop, 30x40; forging shop, 40x40; core room, 16x32; cupola room, 16x18; tumbling room, 16x20; lavatory and heating rooms, 20x40. Machinery will be installed

at a cost of $30,000 and the plant will be one of the most modern in western Canada. T. R. Deacon is president and general manager of the company.

The Strong Enamel & Stamping Co., Bellaire, O., recently incorporated, has purchased a site and it is the intention to build this summer a corrugated iron building 150x280 feet, fully equipped; three furnaces will be utilized at the start. Thos. L. Strong, the general manager, is an expert in enameling. The line will be composed of staples, novelties and specialties.

General Industrial Notes:—

An effort is being made to get the Leffler Electro Magnetic Mfg. Co. to move its plant from Chicago to Birmingham. An officer of the company has stated that a careful test of all iron ore in the country has been made and that that obtained in the Birmingham district is most magnetic, and therefore the best suited for its purpose.

The Philip Meyer Co., Sheboygan, Wis., has changed its name to the Globe Foundry & Machine Co.

It is officially estimated the surplus earnings after payment of interest and taxes of the Sloss-Sheffield Steel & Iron Co. for April were $214,889.

The George A. Hogg Iron & Steel Foundry Co., Pittsburg, has decided to increase its capital stock $650,000, and has placed $600,000 on the market at par value of $50 per share. The proceeds of the sale of this stock are to be used in making additions and improvements to the plant, heretofore referred to.

The Danville Foundry & Machine Co., Danville, Ill., has shipped three carloads of hoisting machinery to British Columbia.

The Jewett Car Works, Newark, O., have had a rapid growth. When the company was established three years ago after its removal from Jewett, O., only 125 men were employed, while now there are 375 on the pay rolls. Within the past three months many improvements have been made. The machine shop and blacksmith shop have been enlarged, as has also the wood machine shop. A large amount of new equipment has been installed.

The American Car & Foundry Co. has secured a contract for five passenger cars for shipment to New Zealand. The cars will be built at the Jackson & Sharp plant, Wilmington, Del.

The Gas Engine & Power Co., Morris Heights, N. Y., was the lowest bidder for the new gunboats Dubuque and Paducah, sealed proposals for which were opened at the navy department May 19. The bid was $295,000 each, if the department's designs are followed complete, and $286,000 if the the department's designs, except boilers, are followed.

The Carberry Machine & Mfg. Co., Ltd., Carberry, Manitoba, has been organized. The following officers were elected: President, William Walker; vice president, H. A. Manville; secretary-treasurer, W. A. Banister; solicitor, John D. Hunt. The company has taken over the local machine shops of John Leckie.

The foundry and machine shop of the Dakota Machinery Co., Devil's Lake, N. D., said to be the largest plant of its kind in either of the Dakotas, is nearly completed, and is in partial operation.

The War Department has awarded to the Featherstone Foundry & Machine Co., of Chicago, a contract for building two dredges for use in Oregon rivers. The company will build one dredge for the Upper Willamette and Yamhill Rivers for $25,000, and another for the Upper Columbia and Snake to cost $22,250.

J. A. Frenzel, Wausau, Wis., has sold his foundry to A. J. Kraatz and F. C. Brach, two young men of Milwaukee, for $4,300, who will hereafter operate the plant.

The Ingoldsby Automatic Car Co., St. Louis, is considering the advisability of establishing a branch of its shops in Denver, Colo. An officer of the company says that as there are no shops west of the Mississippi, the company is inclined to favor Denver, but has not definitely decided what it will do.

The Prudential Trust Co., Cleveland, has been appointed receiver of the American Motor Carriage Co., of that city. The petition of George F. McKay, president of the company, says that it owes $33,000 and has a number of unfinished machines which are worthless in their present condition, but which in six weeks, at an expense of $10,000, could be sold for $40,000.

A number of the stockholders of the Home Stove Co., Indianapolis, expect to build a plant for the manufacture of stoves at Greenfield, Ind. The new concern will not be known as the Home Stove Co., and will not succeed the Indianapolis concern.

The Jones & Laughlin Steel Co. has purchased the Disciple Church at California, Washington County, Pa., for $6,000. It is understood that other property in California will be purchased, but the use to which the plant is to be put has not been made known.

The American Locomotive Co. has recently received an order for 80 locomotives from the New York, New Haven & Hartford Railroad.

Capt. M. S. Marquis, New Castle, Pa., Perry Smith, New Brighton, Pa., and others, are organizing a company for the erection of a blast furnace in Beaver Valley, at the junction of the Beaver and Ohio rivers.

The annual meeting of the stockholders of the Virginia Iron, Coal & Coke Co., was held at Bristol, Tenn., last week. The following directors were chosen: Grant B. Schley, Edward J. Berwind, Walter Ferguson, George A. Croker, Charles B. Squier, Henry K. McHarg and John B. Newton.

Arrangements have been completed for the removal of the Montrose Iron Works, now located at Laurel, Md., and a machine shop in Baltimore, owned by the same company, to Frederick, Md. A lot with a frontage of 500 feet along the Northern Central Railroad was purchased for the plant, the Business Men's Association of Frederick contributing the greater part of the purchase price. The company promises to take to Frederick sixty skilled mechanics and to give employment to about an equal number of local workmen.

D. R. Firestone and Adrian Firestone have leased a building at Wooster, O., and expect to engage in the manufacture of wire specialties.

Messrs. Fisk & Robinson, 35 Cedar St., New York, have issued, as a supplement to their pamphlet "Concerning Iron Making," a number of photographs showing the progress which is being made in the construction at the plant of the Buffalo & Susquehanna Iron Co., at Buffalo, N. Y., where, if everything goes on as expected, the company will blow in one furnace in October. So far as the canal construction is concerned the Pennsylvania Railroad and the Buffalo & Susquehanna Co. have practically reached a very satisfactory agreement. Work on the canal is to be rushed through with all possible speed. The photographs which have just been issued show the plant as it appeared April 18th, just six months after work was commenced and give an idea of the rapid progress that has been made on its construction.

The *Mechanical Review*, of London, says that a committee, appointed by the secretary of state for war, has for some time been considering the question of the production of standard leading screws for lathes for use in government workshops and elsewhere. A machine for this purpose has been built by Sir W. G. Armstrong, Whitworth and Co., to designs approved by this committee, and is to be placed at Bushy House in charge of the committee. There are now under consideration plans of a special building for this machine. It will be the duty of the committee to issue to the government workshops and to the trade certified copies, made by this machine, of the standard screw.

The reorganization of the board of directors of the William Cramp Ship & Engine Building Co. has been perfected. The directors who resigned were Morton Michael, Thomas Dolan, C. A. Griscom and Samuel Dickson. The new directors chosen are H. A. Berwind, William M. Potts, and Henry S. Grove, of Philadelphia, and S. L. Hine and J. W. Dunn, of New York. Of the two New York representatives, Mr. Hine is vice president of the First National Bank, of that city, and Mr. Dunn president of the International Steam Pump Co. W. H. Cramp remains president of the company. The directors are E. S. Cramp vice president, W. H. Barnes, F. S. Potts, and Albert Strauss.